

513
Un3r

SCHOOL
BULLETIN
PUBLICATIONS

REGENTS'

ARITHMETIC

QUESTIONS.



Teachers' Question Books.

The increasing severity of examinations for licenses to teach, and particularly the frequent addition of new subjects to the list upon which examination is held has made books of Examination Questions almost essential to the teacher, that he may test himself in private before submitting to a public ordeal. The best of these are the following.

1. *The Regents' Questions* in Arithmetic, Geography, Grammar and Spelling from the first examination in 1866 to June 1882. Being the 11,000 Questions for the preliminary examinations for admission to the University of the State of New York, prepared by the Regents of the University, and participated in simultaneously by more than 250 academies, forming a basis for the distribution of more than a million of dollars. Complete with Key. Cloth, 16mo, pp. 473. \$2.00.

2. *Complete.* The same as above but without answers. Pp. 340. \$1.00.

In the subjects named, no other Question Book can compare with this either in completeness, in excellence, or in popularity. By Legislative Enactment no lawyer can be admitted to the bar in the State of New York without passing a Regents' Examination in these subjects.

3. *The Dime Question Books*, with full answers, notes, queries, etc. Paper, pp. about 40. Each 10 cts.

Elementary Series.

- 3. Physiology.
- 4. Theory and Practice.
- 6. U. S. History and Civil Gov't.
- 10. Algebra.
- 13. American Literature.
- 14. Grammar.
- 15. Orthography and Etymology.
- 18. Arithmetic.
- 19. Physical and Political Geog.
- 20. Reading and Punctuation.

Advanced Series.

- 1. Physics.
- 2. General Literature,
- 5. General History.
- 7. Astronomy.
- 8. Mythology.
- 9. Rhetoric.
- 11. Botany.
- 12. Zoölogy.
- 16. Chemistry.
- 17. Geology.

Extra Volume, 21. Temperance Physiology.

The immense sale of the Regents' Questions in Arithmetic, Geography, Grammar, and Spelling has led to frequent inquiry for similar questions in advanced subjects. To meet this demand, we have had prepared this series of Question Books, by which the teacher need purchase books only on the subjects upon which special help is needed. Frequently a \$1.50 book is bought for the sake of a few questions in a single study. Here, the studies may be taken up one at a time, a special advantage in New York, since applicants for State Certificates may now present themselves for examination in only part of the subjects, and receive partial Certificates to be exchanged for full Certificates when all the branches have been passed. The same plan is very generally pursued by county superintendents and commissioners who are encouraging their teachers to prepare themselves for higher certificates.

4. *The Common School Question Book.* By ASA L. CRAIG. Cloth, 12 mo., pp. 340. \$1.50

The sale of this book continues marvellous. There is probably no county in the United States where copies may not be found. We give it now a much handsomer binding than heretofore.

5. *New York State Examination Questions.* Cloth, 16mo, pp. 180. 50 cts.

This contains all the questions given at all the New York Examinations for State Certificates from the beginning. There are more questions and in greater variety than in any other collection. It does not give answers.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

THE

NOTICE: Return or renew all Library Materials! The Minimum Fee for each Lost Book is \$50.00.

The person charging this material is responsible for its return to the library from which it was withdrawn on or before the **Latest Date** stamped below.

Theft, mutilation, and underlining of books are reasons for disciplinary action and may result in dismissal from the University.

To renew call Telephone Center, 333-8400

UNIVERSITY OF ILLINOIS LIBRARY AT URBANA-CHAMPAIGN

MAY 12 1994

DUE 5/6/94

UIC-RECD JAN 31 '94

FEB 16 RECD

Teachers' Question Books.

The increasing severity of examinations for licenses to teach, and particularly the frequent addition of new subjects to the list upon which examination is held has made books of Examination Questions almost essential to the teacher, that he may test himself in private before submitting to a public ordeal. The best of these are the following.

1. *The Regents' Questions* in Arithmetic, Geography, Grammar and Spelling from the first examination in 1866 to June 1882. Being the 11,000 Questions for the preliminary examinations for admission to the University of the State of New York, prepared by the Regents of the University, and participated in simultaneously by more than 250 academies, forming a basis for the distribution of more than a million of dollars. *Complete with Key.* Cloth, 16mo, pp. 473. \$2.00.

2. *Complete.* The same as above but without answers. Pp. 340. \$1.00.

In the subjects named, no other Question Book can compare with this either in completeness, in excellence, or in popularity. By Legislative Enactment no lawyer can be admitted to the bar in the State of New York without passing a Regents' Examination in these subjects.

3. *The Dime Question Books*, with full answers, notes, queries, etc. Paper, pp. about 40. Each 10 cts.

Elementary Series.

3. Physiology.
4. Theory and Practice.
6. U. S. History and Civil Gov't.
10. Algebra.
13. American Literature.
14. Grammar.
15. Orthography and Etymology.
18. Arithmetic.
19. Physical and Political Geog.
20. Reading and Punctuation.

Advanced Series.

1. Physics.
2. General Literature.
5. General History.
7. Astronomy.
8. Mythology.
9. Rhetoric.
11. Botany.
12. Zoölogy.
16. Chemistry.
17. Geology.

Extra Volume, 21. Temperance Physiology.

The immense sale of the Regents' Questions in Arithmetic, Geography, Grammar, and Spelling has led to frequent inquiry for similar questions in advanced subjects. To meet this demand, we have had prepared this series of Question Books, by which the teacher need purchase books only on the subjects upon which special help is needed. Frequently a \$1.50 book is bought for the sake of a few questions in a single study. Here, the studies may be taken up one at a time, *a special advantage in New York, since applicants for State Certificates may now present themselves for examination in only part of the subjects, and receive partial Certificates to be exchanged for full Certificates when all the branches have been passed.* The same plan is very generally pursued by county superintendents and commissioners who are encouraging their teachers to prepare themselves for higher certificates.

4. *The Common School Question Book.* By ASA L. CRAIG. Cloth, 12 mo., pp. 340. \$1.50

The sale of this book continues marvellous. There is probably no county in the United States where copies may not be found. We give it now a much handsomer binding than heretofore.

5. *New York State Examination Questions.* Cloth, 16mo, pp. 180. 50 cts.

This contains all the questions given at all the New York Examinations for State Certificates from the beginning. There are more questions and in greater variety than in any other collection. It does not give answers.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

REGENTS' QUESTIONS

FROM THE FIRST EXAMINATION IN 1866
TO 1882,

BEING THE 5500 QUESTIONS FOR THE FIRST 48 PRELIMINARY EXAMINATIONS
FOR ADMISSION TO THE

UNIVERSITY OF THE STATE OF NEW YORK

PREPARED BY THE
REGENTS OF THE UNIVERSITY,

AND PARTICIPATED IN SIMULTANEOUSLY BY NEARLY TWO HUNDRED AND FIFTY ACADEMIES, FORMING A BASIS FOR DISTRIBUTING MORE THAN A MILLION OF DOLLARS.

COMPILED BY
DANIEL J. PRATT, A.M., PH.D.,
ASSISTANT SECRETARY, REGENTS OF THE UNIVERSITY.

Part I. ARITHMETIC.



UNIVERSITY OF
ILLINOIS LIBRARY
URBANA-CHAMPAIGN
MATHEMATICS

SYRACUSE, N. Y.:
C. W. BARDEEN, PUBLISHER,
1887.

COPYRIGHT, 1877, 1880, 1886, BY C. W. BARDEEN.

DATES OF THE EXAMINATIONS IN ARITHMETIC.

The fifty examinations in Arithmetic are numbered, and the date upon which each was held will be found in the following table, opposite the corresponding number.

1. Nov. 8, 1866.	18. June 6, 1872.	35. Feb. 28, 1878.
2. March 1, 1867.	19. Nov. 7.	36. June 6.
3. June 14.	20. Feb. 27, 1873.	37. Nov. 7.
4. Nov. 8.	21. June 5.	38. Feb. 27, 1879.
5. Feb. 21, 1868.	22. Nov. 6.	39. June 5.
6. June 5.	23. Feb. 26, 1874.	40. Nov. 6.
7. Nov. 13.	24. June 4.	41. Feb. 26, 1880.
8. Feb. 19, 1869.	25. Nov. 5.	42. June 3.
9. June 11.	26. Feb. 25, 1875.	43. June 17.*
10. Nov. 11.	27. June 3.	44. Nov. 11.
11. Feb. 11, 1870	28. Nov. 4.	45. March 3, 1881.
12. June 9.	29. Feb. 24, 1876.	46. March 25.*
13. Nov. 11.	30. June 8.	47. June 16.
14. Feb. 23, 1871.	31. Nov. 9.	48. Nov. 17.
15. June 8.	32. March 1, 1877.	49. March 2, 1882.
16. Nov. 9.	33. June 7.	50. June 15.
17. Feb. 27, 1872.	34. Nov. 8.	

* Substitute examination, protest having been made against the difficulty of the preceding one.

UNIVERSITY OF ILLINOIS
Pedagogical Library & Museum.

513.4
Un 3r

ARITHMETIC.

— 1 —

1. Write in figures each of the following numbers, add them, and express in words (or numerate) their sum: fifty-six thousand, and fourteen thousandths; nineteen, and nineteen hundredths; fifty-seven, and forty-eight ten-thousandths; twenty-three thousand five, and four tenths; and fourteen millionths.
2. What is the difference between $3\frac{3}{4}$ plus $7\frac{5}{8}$, and .4 plus $2\frac{3}{4}$?
3. In multiplying by more than one figure, where is the first figure in each partial product written, and why is it so written?
4. If the divisor is 19, the quotient 37, and the remainder 11, what is the dividend?
5. What is the quotient of 65 bu. 1 pk. 3 qt. divided by 12?
6. Which one of the fundamental operations (or ground rules) of arithmetic is employed in reduction descending? Give an example.
7. In exchanging gold dust for cotton, by what weight would each be weighed?
8. What is the only even prime number?
9. How many weeks in 8,568,456 minutes?
10. To what *term* in division does the *value* of a common fraction correspond?

38. Find the value of the omitted term in the following proportion:—

$$\$4 : (?) :: 9 : 16.$$

39. If 56 lb. of butter cost \$15.68, what will .078 of a ton cost?

40. If 96 horses eat 192 tons of hay in one winter, how many tons will 150 horses eat in 6 winters?

41. In one yr. 4 mo., \$311.50 amounted to \$336.42 at simple interest: what was the rate per cent?

42. What is the interest of \$14,231.50 from June 29, 1860, to April 30, 1865, at $8\frac{1}{4}$ per cent?

43. Three notes are payable as follows:—one for \$200, due January 1, 1866; another for \$350, due September 1, 1866; a third for \$500, due April 1, 1867: what is the average of maturity, or the equated time of payment?

44. How much will it cost to carpet a parlor 18 feet square, with carpeting $\frac{3}{4}$ yd. wide, at \$1.50 per yd.?

45. The difference in the local time of two places is 2 hr. 18 m.: what is the difference in longitude?

46. 33 is $2\frac{3}{4}$ per cent. of what number?

47. What is the length of each side of a square field which contains 5 acres?

48. A note for \$470.66 drawn at 60 days, is discounted at bank at 6 per cent.: what are the proceeds?

— 3 —

49. Express in figures MD~~XXV~~CDLXXXIX.

50. Perform the operations indicated as follows:—

$$102 - 19 \times 17 \text{ plus } 205 \div 3 = ?$$

51. Numerate (or express in words) 90067236708.

52. What is the sum of 3912, 361, 40005, 98, 736863, 8342, 2900687, 9, 4000862, 28?

53. If two persons start from the same place, and travel in the same direction, one 7 and the other 11 miles per hour, at the rate of 9 hours per day, how far apart will they be at the end of the 17th day?

54. What is the amount due on the following bill of parcels:

ALBANY, June 1, 1866.

JOHN BARNES,

Bought of NATHAN HADLEY & Co.,

16 lb. tea, @ 1.05	-	-	-	\$
18 lb. sugar, @ .14	-	-	-	
25 lb. rice, @ .09	-	-	-	
15 yd. linen, @ .66	-	-	-	
				—
	CR.			\$
By balance of account,	-	-	-	2.48
				—
Balance due,	-	-	-	\$
Received payment, N. HADLEY & Co.				

55. State the process of reducing inches to leagues.

56. How many bu. will a box 8 ft. long, 4 ft. wide, and 3 ft. high contain?

57. Add $\frac{3}{6} \frac{8}{7}$, $\frac{3}{4}$ and $\frac{1}{10} \frac{7}{1}$.

58. Reduce $\frac{1}{8} \frac{9}{3} \frac{8}{2}$ to its lowest terms.

59. Give the rule for reducing fractions having different denominators to equivalent fractions having the least common denominator.

60. Multiply $18 \frac{5}{6}$ by $7 \frac{1}{3}$.

61. Express in figures, forty-seven, and twenty-one hundred-thousandths.

62. Divide 2019.86928 by $30 \frac{1}{2} \frac{1}{6}$.

63. If 9 men cut 150 acres of grass in 18 days, how many will do the same work in 27 days?
64. If 500 copies of a book containing 210 pages require 12 reams of paper, how much will 1,200 copies of a book of 280 pages require?
65. What is the value in currency of \$865 in gold, when the latter is selling at 131 per cent?
66. What is the interest on \$200 for three years and ten months, at 7 per cent?
67. In what time will a sum of money double itself at an annual interest of 5 per cent?
68. What is the face of a note at 30 days, which yields \$500 when discounted at bank, at 7 per cent?
70. Extract the square root of .0043046721.
71. Involve 1.06 to the 4th power.
72. What debt can be discharged in a year by weekly payments in arithmetical progression, the first being \$24, and the last \$1,224?

—4—

73. Express in words 2584503962047.
74. $2468 + 13579 + 100 + 6042 + 187 + 19 = ?$
75. What is the difference between $576 - 208 + 1645 - 321$, and $403 - 256 + 814 - 195$?
76. Multiply forty-nine million forty thousand six hundred and ninety-seven, by nine million forty thousand and seven hundred and nine.
77. One factor of a certain number is 11, and the other 3708311605: what is that number?
78. If the remainder is 17, the quotient 610, and the dividend 45767, what is the divisor?

79. What cost 3 A. 2 R. 20 rd. of land, at \$43 per acre? ~~\$165.875~~

80. What is the difference of time between July 15, 1857, and April 25, 1862? ~~4 years~~

81. Add	T.	cwt.	qr.	lb.	oz.	dr.
	14	13	2	15	15	15
	13	17	3	13	11	13
	46	16	3	11	13	10
	14	15	2	7	6	9
	11	17	3	10	15	11
	<u>102</u>	<u>1</u>	<u>3</u>	<u>9</u>	<u>7</u>	<u>75</u>

82. Find the greatest common divisor of 492, 744 and 1044. $2 \times 2 \times 3 = 12$

83. Divide 137 lb. 9 oz. 18 pwt. 22 gr. by 23.

84. From $\frac{2}{3}$ of 137 subtract $\frac{1}{2}$ of 317.

85. Write eleven thousand, and eleven hundred-thousandths, (the whole as a single expression.)

86. Multiply .0097 by .000125.

87. Divide 475 by $128\frac{5}{8}$.

88. What cost $\frac{11}{13}$ of an acre at \$1.75 per sq. rod?

89. Divide 9811.0047 by .325947.

90. Reduce 18 s. $3\frac{3}{4}$ d. to the decimal of a £.

91. Find the third term of $7 : 8 :: (?) : 12$.

92. If $2\frac{1}{4}$ yd. of broadcloth cost \$18, what will 27 yd. cost?

93. If 8 men spend \$64 in 13 weeks, what will 12 men spend in 52 weeks? ~~384~~

94. Find the interest on \$35.61 from Nov. 11, 1857 to Dec. 15, 1859, at 6 per cent. ~~9.51~~

95. What is the bank discount on a note for \$350, payable 3 months after date, at 7 per cent. interest?

96. Find the square root of .876096.

— — 5 — —

97. Add together 15262986957 and 3879, and multiply the 19th part of the sum by 76.
98. Subtract nine hundred and fourteen thousand nine hundred and twenty, from four hundred millions and thirteen thousand.
99. A wheel makes 880 revolutions in passing over 2 mi. 1,430 yd.: what is its circumference?
100. Reduce 49 wk. 6 da. 19 hr. to minutes.
101. Find the greatest common divisor of 4004 and 5772.
102. Find the least common multiple of 25, 36, 33, 12, 45.
103. Divide 52 yd. 1 ft. $10\frac{1}{2}$ in. by $3\frac{2}{7}$.
104. Reduce $3\frac{8}{9}$ of $1\frac{7}{32}$ of $2\frac{5}{14}$ to a decimal.
105. Find the value of 169 multiplied by .0000728.
106. Find the value of $25.000315 - .0045$ plus .2801 minus 18 plus 21.001.
107. Divide the number 54 into 3 parts, proportioned as 2, 3, 4.
108. If for a certain sum 18 sheep may be grazed 20 days, how many days may 30 sheep be grazed for the same sum?
109. How many acres could 10 men plow in 14 hours, if 5 men plow 6 acres in $10\frac{1}{2}$ hours?
110. Standard silver is composed of 37 parts of pure silver, and 3 parts of copper: how much per cent of the whole is each of the components?
111. If I buy cloth at \$1.20 per yard, how must I sell it so as to gain 25 per cent?
112. Divide \$1,200 between A. and B. so that A.'s share may be to B.'s as 2 to 7.

113. Divide 6 s. 6 d. between Jane and Ellen, so that Jane may receive 3 s. more than Ellen.

114. What is the value of the square root of $42 \times 24 \times 28$?

115. How much coffee at 9, 11 and 14 cents a pound, will form a mixture worth 12 cents a pound?

116. When the extremes and the number of terms in an arithmetical series are given, how is the sum of the series ascertained?

117. The surface of a square table is 26 sq. feet, 100 in.: find the length of each side.

118. How many square yards of matting would cover a floor, the dimensions of which are 20 ft. 10 in., by 15 ft. $5\frac{1}{4}$ in.?

119. What sum of money will in 3 years, 10 mo. and 9 days at 7 per cent. amount to \$1,524.10?

120. I have three notes payable as follows: one for \$200, due Jan. 1, 1869; another for \$350, due Sept. 1, 1869; and another for \$500, due April 1, 1870; what is the average of maturity?

— 6 —

121. Express in figures the number represented by four units of the tenth order, six of the eighth, four of the seventh, two of the sixth, one of the third, and five of the second.

122. Numerate the expression obtained in the answer to Q. 121.

123. How may 25,000 be expressed in Roman numerals?

124. How is the *local* value of a figure determined, or upon what does it depend?

125. What is the sum of the composite numbers from 50 to 80 inclusive?

126. From sixty-five trillion three million six hundred and twelve, take nine billion one million four thousand and six.

127. A tax of thirty million fifty-six thousand four hundred and sixty-five dollars is assessed equally on four thousand and ninety-seven towns: what sum must each town pay?

128. Which of the fundamental rules is employed in reducing a denominative fraction to integers of lower denominations?

129. How many cubic inches does the standard unit of liquid measure contain?

130. How many cords of wood in a pile 140 ft. long, $4\frac{1}{2}$ ft. wide, and $6\frac{1}{2}$ ft. high?

131. A stationer bought 1 great gross of slates at 9 pence each; what was the whole cost, in pounds sterling?

132. Of what factors of two or more numbers does their greatest common divisor consist?

133. What is the smallest sum of money with which horses can be bought at \$50 each, cows at \$30 each, or sheep at \$8 each, using the same amount in each case?

134. Express in words 0.500072.

135. What number must be multiplied by $15\frac{2}{3}$ that the product may be $56\frac{1}{2}$?

136. How is the value of a fraction affected when its denominator is divided by a number greater than unity?

137. How do you multiply .061 by 100,000?

138. What amount is due on the following items?:

37 chests green tea	at \$ 23 75 each.
42 " black "	" 17 50 "
12 crates Liverpool ware	" 175 00 "
19 bbl. Genesee flour	" 15 50 "
23 bu. rye	" 1 52 "
	\$—

139. When are four quantities said to be in proportion?

140. If $\frac{4}{5}$ of the distance from A to B is 32 miles, what is $\frac{5}{12}$ of the same distance?

141. How is the rate per cent ascertained when the *principal, interest, and time* are given.

142. If \$300 gain \$18 in nine months, what is the per cent?

143. What is the length, in feet and inches, of each side of a square carpet, made from $49\frac{1}{2}$ yd. of Brussels carpeting, $\frac{3}{4}$ yd. wide?

144. How is the *last term* of a geometrical series found, the *first term, ratio, and number of terms* being given?

— 7 —

145. Express in figures six hundred million seventeen thousand three hundred and eight.

146. What is the sum of 372856, 404932, 2704793, 9078961, 304165, 207708, 41274, 375, 271, 34 and 6?

147. From sixty-five billion three million six hundred and twelve, take nine billion one million four thousand and six.

148. One factor of a certain number is 11, and the other 3708311605: what is that number?

149. What are the prime factors of 800? 2 2 2 2 5 5

150. If the quotient is 482, and the divisor 281, what is the dividend? *1357462*

151. If I take 13729 from the sum of 8762 and 14967, divide the remainder by 50, and multiply the quotient by 19, what is the product? *3813*

152. How many miles in 60,750 links? *38*

153. What is the sum of $\frac{4}{25}$ of $9\frac{3}{5}$, and $\frac{4}{21}$ of $328\frac{2}{3}$? *32*

154. Reduce $\frac{5}{7}$ of $\frac{14}{25}$ of $6\frac{1}{5}$ of 17 to a simple fraction. *32*

155. How many times is $\frac{5}{3}$ contained in 837? *164*

156. Reduce $\frac{9}{25}$ of an acre to lower denominations. *4*

157. Find the greatest common divisor of 492, 744, 906. *152*

158. What is the least common multiple (or dividend) of the nine digits? *2520*

159. Divide 0.01764144 by 0.0018. *9.79*

160. Reduce 7 fur. 29 rd. to the decimal of a mile. *1.15*

161. What sum, at 7 per cent, will amount to \$221.075 in 3 years 4 months?

162. What is the amount of \$1,200 for 2 years at 6 per cent compound interest, payable quarterly? *180*

163. If \$100 gain \$6 in 1 year, what principal will gain \$12 in 8 months?

164. To what number has $\frac{1}{2}$ the same ratio as exists between 3 and 21? *3*

165. What number of men will be required to perform a piece of work in 8 days, that would take 15 men 24 days? *10*

166. A. and B. enter into partnership. A. furnishes \$240 for 8 months; and B. \$560 for 5 months. They lose \$118. How much does each lose? *46.0*

167. What is the square root of 61723020.96?

168. How many cubic quarter-inches are contained in a cubic inch?

— 8 —

169. Add the following numbers: One hundred and eight billion three hundred and six; twenty-one billion twenty thousand two hundred and ten; thirty billion twenty-nine million and three.

170. Reduce 2,579,792 drams avoirdupois to higher denominations.

171. Reduce 1 mi. 18 rd. 2 yd. 2 ft. to inches.

172. Multiply $\frac{2}{3}$ of $1\frac{2}{7}$ by $3\frac{1}{2} \div 16$.

173. Divide $\frac{3}{12}$ of $1\frac{8}{21}$ by $\frac{6}{7}$.

174. Find the least common multiple of all the even numbers from 1 to 15.

175. From the sum of $\frac{2}{3}$ and $\frac{4}{5}$ take $\frac{5}{18}$.

176. Add together $4\frac{1}{3}\frac{1}{2}$ hhd. and $\frac{2}{7}$ gill.

177. Multiply 30.6002 by two and one ten-thousandth.

178. Divide 4.08 by .000136.

179. Reduce $\frac{378}{1335}$ to a decimal.

180. Reduce 8 oz. 5 pwt. 3 gr. to the decimal of a lb.

181. If 21 men in 12 days can do certain work, how many men in 7 days could do $\frac{2}{3}$ as much?

182. How much will it cost to dig a cellar 40 ft. long, 32 ft. wide, and 5 ft. deep, at \$0.25 a cubic yard?

183. A. begins business with \$500; at the end of 2 months B. puts in \$300; at the end of 1 month more C. puts in \$600; at the end of 5 months more the profits amount to \$1,056. What is each man's share?

184. 3 pence is what per cent of 4 shillings?

185. What sum in 1 year will yield \$48.75 at $12\frac{1}{2}$ per cent?

186. What is the bank discount on a note for \$600 for 2 months and 9 days, at 10 per cent per annum?

187. I sell goods for \$511.29 and gain $9\frac{1}{4}$ per cent: what did the goods cost me?
188. At what rate will \$500 yield \$34 interest in 1 year, 1 month, and 18 days?
189. What is the compound interest of \$200 for 3 years at 7 per cent?
190. How much gold will \$100 currency buy, gold being at 147?
191. What is the square root of 403.6081?
192. What is the cube root of $\frac{1061208}{64000}$?

— 9 —

193. The factors of a number are three hundred ninety-seven thousand five hundred, and nine thousand eight hundred. What is the product expressed in words?
194. If one man can mow 1.875 acres in a day, how many acres can 13 men mow in 7.5 days?
195. How many reams of commercial note paper each 8 in. long, 5 in. wide, and 3.5 in. thick, can be packed in a box, the inside dimensions of which are $4, 1\frac{1}{3}$, and $1\frac{1}{2}$ feet respectively?
196. A note given May 10, 1867, was paid August 10, 1868. How long did the note run?
- 196a. How long is a field containing 14 A., if it is 35 rd. wide?
197. If I start from latitude $15^{\circ} 35' 40''$ north, and travel due north 2,159 geographic miles, in what latitude shall I then be?
198. How many seconds in the circumference of a circle?

199. Is 217 a prime or a composite number?
200. The four sides of my garden are 168 ft., 280 ft., 182 ft., and 252 ft. respectively: what is the greatest length of boards that I can use in fencing it, without cutting any of them?
201. What is the smallest sum of money for which a person can purchase oxen at \$85 each, or cows at \$35 each?
202. The tide rose $\frac{5}{6}$ ft. one hour, $\frac{13}{18}$ ft. the next, and $\frac{3}{4}$ ft. the third hour: how much did it rise in the three hours?
203. How many square rods are there in a lot $15\frac{1}{3}$ rods long and $12\frac{6}{7}$ rods wide?
204. If $8\frac{2}{3}$ qt. of strawberries cost $\$3\frac{3}{8}$ what is the price per qt.?
205. The product of three factors is $19\frac{1}{2}$, and two of them are $1\frac{1}{2}$ and $2\frac{5}{6}$; what is the other?
206. Reduce 4 da. 4 hr. 48 m. to the decimal of a week.
207. If 5 tons of coal are equal to 9 cords of wood for fuel, and a family burn 31.5 cords of wood in a year, how much will they save by changing from wood to coal, when wood is worth \$4.25 per cord, and coal \$6.80 per ton?
208. When it is 12 o'clock m. at St. Paul, $93^{\circ} 10'$ W. Longitude, what is the time at Richmond, $77^{\circ} 27'$ W.?
209. Reduce .06875 to the form of a common fraction and to its lowest terms.
210. 24 is $\frac{2}{3}$ per cent of what number?
211. What will \$25,390 amount to in 7 mo., at 10 per cent?

212. When gold is worth 124, what amount of currency can be bought for \$5,400 in gold?

213. A.'s property is assessed at \$6,750, and B.'s at \$13,575. A.'s tax is \$52.65: how much is B.'s?

Find the unknown term in the following proportions:

214. $7\frac{1}{2} : 6\frac{1}{4} :: \text{—} : 5.$

215. $7 : 21 \left\{ \begin{array}{l} :: 3 : \text{—} \\ 4 : 8 \end{array} \right.$

216. What is the square root of 1127750724?

— 10 —

217. Add in figures, LXVI, MDXIX, CCIV, XVIII.

218. From sixty-eight million nine hundred thousand and six, take seven million two hundred thousand and two.

219. Six hundred and four is one factor, ninety-six thousand and seventy-three is the other: what is the product?

220. Which term in division corresponds with the product in multiplication?

221. Give the method of proving division.

222. Resolve 7498 into its prime factors.

223. Find the greatest common divisor of 505, 707, and 4343.

224. Of what is the least common multiple of several numbers the product?

225. Find the smallest number that exactly contains 78, 156 and 390.

226. Express in words $\frac{40203}{70607}$.

227. Reduce 387 to eighty-fifths.

228. What is the cost of four fields, containing respectively $4\frac{1}{3}$, $2\frac{1}{2}$, $3\frac{2}{3}$, and $1\frac{3}{4}$ acres, at \$25 an acre?

229. What is the rate per hour of a boat that goes $230\frac{9}{10}$ miles in $18\frac{3}{5}$ hours?

230. Write as a decimal, $\frac{3241}{1000000}$.

231. Required the area in acres, etc., of a piece of land .5 of a mile long and .3 of a mile broad.

232. From 1 lb. Troy, take 10 oz. 17 pwt. 18 gr.

233. Sold 517 bbl. of flour for \$8.10 per bbl., at a profit of 8 per cent.; what was the whole cost?

234. 1 rd. : $\frac{1}{2}$ ft. :: ? : \$0.50.

235. $(\frac{2}{5})^4 = ?$

236. What is the square root of .0011943936?

237. What is the amount of \$50, at compound interest for 3 years, at 8 per cent., interest payable half-yearly?

238. A note for \$486, dated September 7, 1863, was endorsed as follows: Received, March 22, 1864, \$125. Nov. 29, 1864, \$150. May 13, 1865, \$120. What was the balance due April 19, 1866, the rate being 6 per cent?

239. What are the proceeds of a note for \$426.10, payable in 57 days, with interest at 6 per cent, discounted at bank for 6 per cent?

240. If \$400, at 7 per cent., in 9 mo., produce \$21 interest, what will be the interest on \$360, for 8 mo., at 6 per cent?

(Solve by proportion.)

— 11 —

241. Multiply twenty-nine million two thousand nine hundred and nine, by four hundred and four thousand.

242. Divide 478656785178 by 56789.

243. Prove that your solution of the last example is correct.

244. A gem weighing 2 oz. 18 pwt. 12 gr. was sold for \$1.37 per grain: what was the sum paid?

245. Venus is at a certain time 3 S. $18^{\circ} 45' 15''$ east of the sun; Mars, 7 S. $15^{\circ} 36' 18''$ east of Venus; Jupiter, 5 S. $21^{\circ} 38' 27''$ east of Mars: how far is Jupiter east of the sun?

246. What is the least common multiple (or dividend) of 3, 4, 5, 6, 7 and 8?

247. What is $\frac{1}{8}$ of $\frac{9}{11}$ of $\frac{2}{3}$ of $\frac{1}{4}$ expressed in lowest terms?

248. Add $\frac{1}{3}$ of $\frac{2}{3}$ to $\frac{1}{5}$ of $\frac{7}{10}$.

249. Divide $81\frac{1}{4}$ by $9\frac{1}{2}$.

250. What is the greatest common divisor of $\frac{3}{4}$, $\frac{5}{6}$, and $1\frac{1}{8}$?

251. Multiply eighty-seven thousandths by fifteen millionths.

252. What decimal fraction is equivalent to $\frac{7}{16}$?

253. Reduce 6 fur. 8 rd. to the decimal of a mile.

254. What is the value of .815625 of a pound Troy expressed in oz. pwt. and gr.?

255. If \$800 gain \$32 in 8 mo., what is the rate per cent?

256. If a man travels 117 miles in 15 days, employing only 9 hours a day, how far would he go in 20 days, traveling 12 hours a day?

257. What is the square root of 9754.60423716?

258. If the extremes are 11 and 74, and the common difference 7, what is the sum of the series?

259. A man having \$10,000, lost 15 per cent of it; what sum had he left?

260. What is the interest of \$850 for 1 year 7 mo. 18 days, at 7 per cent.?
261. How long must \$165 be on interest at 6 per cent. to gain \$14.85?
262. What is the present worth of \$477.71, due 4 years hence, discounted at 6 per cent?
263. What is the present worth of a note for \$875.35, payable in 7 mo. 15 days, discounted at bank at 7 per cent?
264. If 29 lb. of butter will purchase 40 lb. of cheese, how many pounds of butter will buy 79 lb. of cheese?

 — 12 —

265. Numerate, read or express in words 8096392702.
266. Find the sum of $\begin{array}{r} 91784 \\ 794380 \\ \hline 79840 \end{array}$ $\begin{array}{r} 400084 \\ 5631 \\ \hline 957001 \end{array}$ $\begin{array}{r} 849987 \\ 451786 \\ \hline 4670 \end{array}$ $\begin{array}{r} 501 \\ | \\ 501 \end{array}$
267. $2579584239456 - 249187654116 = ?$
268. Multiply four hundred and sixty-two thousand six hundred and nine, by itself.
269. Divide 1521808704 by 6503456.
270. If the remainder is 17, the quotient 610, and the dividend 45767, what is the divisor?
271. Resolve 7498 into its prime factors.
272. Find the greatest common divisor of 285 and 465.
273. What is the least common multiple, or dividend, of 16, 40, 96, and 105?
274. In 4 da. 4 hr. 45 min., how many seconds?
275. Reduce $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}, \frac{1}{8}, \frac{1}{9}$, to equivalent fractions having the least common denominator.
276. Reduce 4 oz. 6 pwt. $9\frac{3}{5}$ gr. to the fraction of a pound.
-

277. How many sq. ft. in the four side walls of a room $16\frac{1}{2}$ ft. long, 15 ft. wide, and 9 ft. high?
278. The product of three numbers is $\frac{4}{5}$; two of the numbers are $2\frac{1}{2}$ and $\frac{4}{3}$: what is the third?
279. Add together 423 ten-millionths, 63 thousandths, 25 hundredths, 4 tenths, and 56 ten-thousandths.
280. What cost 5 T. 17 cwt. 20 lb. of hay, at \$30.50 per ton?
281. Reduce 10 oz. 13 pwt. 9 gr. to the decimal of a pound Troy.
282. Divide 0.01654144 by 0.0018.
283. One acre of corn yields 80 bushels, another acre 20 per cent more; how many bushels does the second acre yield?
284. What is the amount of \$794 for 4 years and 4 months, at 7 per cent?
285. What is the bank discount of \$600 for 3 mo., at 6 per cent?
286. If $\frac{3}{16}$ of a ship cost £273 2s. 6d., what will $\frac{5}{32}$ cost?
287. If \$200 gain \$12 in one year, what will \$400 gain in 9 months?
288. Find the square root of $4\frac{2}{5}$.

— 13 —

289. Write in figures each of the following numbers, add them, and express in words (or numerate) their sum: fifty-six thousand, and fourteen thousandths; nineteen, and nineteen hundredths; fifty-seven, and forty-eight ten-thousandths; twenty-three thousand five, and four tenths, and fourteen millionths.

290. What is the difference between $3\frac{3}{4}$ plus $7\frac{5}{8}$ and 4 plus $2\frac{3}{4}$?

291. In multiplying by more than one figure, where is the first figure in each partial product written, and why is it so written?

292. If the divisor is 19, the quotient 37, and the remainder 11, what is the dividend?

293. What is the quotient of 65 bu. 1 pk. 3 qt. divided by 12?

294. Which one of the fundamental operations (or ground rules) of arithmetic is employed in reduction ascending?

295. In exchanging gold dust for cotton, by what weight would each be weighed?

296. Which is the largest prime number below 100?

297. How many weeks in 8568456 minutes?

298. To what *term* in division does the *value* of a common fraction correspond?

299. What is the product of a fraction multiplied by its denominator? Give an example.

300. What is the rule for the multiplication of decimals?

301. How is a common fraction reduced to the decimal form? Give an example.

302. What is *ratio* and how may it be expressed? Illustrate by one or more examples.

303. If 27 T. 3 qr. 15 lb. of coal cost \$217.83, what will 119 T. 1 qr. 10 lb. cost?

304. Find the cost of the several articles, and the amount of the following bill:

ALBANY, October 1, 1870.

A. P. JEWETT to SAMUEL PALMER, Dr.

To 16750 feet of boards at \$12.50 per M., - - -

" 1750 " " 24.00 " - - -

" 3500 " " 25.00 " - - -

Received payment, \$

SAMUEL PALMER.

305. What is the length of the side of a cubical box which contains 389017 solid inches?

306. What is the present worth of the following note discounted at bank, and when will it become due?

\$100. UTICA, October 11, 1870.

Ninety days from date, for value received, I promise to pay to the order of John Smith, one hundred dollars, at the Albany City National Bank.

JOHN BROWN.

307. Involve $\frac{5}{8}$ to the 7th power.

308. What is the square root of .0043046721?

309. Sold $9\frac{1}{2}$ cwt. of sugar at $\$8\frac{1}{4}$ per cwt., and thereby lost 12 per cent: how much was the whole cost?

310. A person owned $\frac{5}{8}$ of a mine and sold $\frac{3}{4}$ of his interest for \$1,710: what was the value of the entire mine?

311. When it is 2 hr. 36 m. A.M. at the Cape of Good Hope, in longitude $18^{\circ} 24'$ east, what is the time at Cape Horn, in longitude $67^{\circ} 21'$ west?

312. What is the cost of 17 T. 18 cwt. 1 qr. 17 lb. of potash at \$53.80 per ton?

— 14 —

313. Express in words the number 42567000129301.

314. Multiply five hundred and forty thousand six hundred and nine by seventeen hundred and fifty.

315. Give the rule for reduction descending.
316. How many steps of two and one-half feet each, would a man take in walking a mile?
317. How is a whole number reduced to a fraction of the same value having a given denominator?
318. What is the value of $\frac{2}{3}$ of $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{1}{2}$ when reduced to a simple fraction of the lowest terms?
319. Give the rule for reducing several fractions to equivalent fractions having the least common denominator.
320. Add $3\frac{2}{3}$ to $4\frac{2}{3}\frac{1}{8}$.
321. Write in figures, two and six hundred-millionths.
322. Reduce $\frac{7}{625}$ to the equivalent decimal form.
323. Multiply seven thousand and five, by three-hundred-and-five millionths.
324. Divide .5 of 1.75 by .25 of $17\frac{1}{2}$.
325. The ratio of two numbers is 9, and the antecedent 90; what is the consequent?
326. Find the value of the omitted term in the following proportion:
- $$\$4 : (?) :: 9 : 16.$$
327. If 56 lb. of butter cost \$15.68, what will .078 of a ton cost?
328. If 96 horses eat 192 tons of hay in one winter, how many tons will 150 horses eat in 6 winters?
329. In 1 yr. 4 mo., \$311.50 amounted to \$336.42 at simple interest: what was the rate per cent?
330. What is the interest of \$14,231.50 from June 15, 1865, to April 30, 1870, at 8 per cent?
331. What is the value of a pile of wood 34 ft. long, 3 ft. wide, and $5\frac{1}{3}$ ft. high, at \$7.88 per cord?

332. How much will it cost to carpet a parlor 18 feet square, with carpeting $\frac{3}{4}$ yd. wide, at \$1.50 per yard?

333. The difference in the local time of two places is 2 hr. 18 m.: what is the difference in longitude?

334. 33 is $\frac{2}{3}$ per cent. of what number?

335. What is the length in rods of each side of a square field which contains 66 A. 1 R. 9 sq. rd.?

336. A note for \$470.66 drawn at 60 days, is discounted at bank at 6 per cent: what are the proceeds?

— 15 —

337. Arrange the following numbers as required for addition, and find their sum; 70100.3042875; 20514471; 641077.21875; 2564308.875; 320538.609375; 10257235 $\frac{1}{2}$; 1282154.4375; 90169.0004; 5128617.75; 160269.3046875.

338. What special name or names are given to the period (.), as an arithmetical sign; and what is its use in arithmetic?

339. What two denominations of currency are separated and distinguished from each other by the period used as an arithmetical sign?

340. Mention two or more arithmetical processes or rules in which "Pointing off into periods" is required?

341. Point off into periods and numerate 70100.-3042875.

342. What arithmetical operation would change the value of 320538.609375 to 32.0538609375?

343. Subtract 70100.3042875 from 10257235 $\frac{1}{2}$.

344. Multiply 1282154.4375 by 90169.0004.

345. Divide 10257235 $\frac{1}{2}$ by 641077.21875, and indicate by the use of the proper arithmetical sign, whether the quotient is an integral, fractional or mixed number.

346. Change the decimal part of 90169.0004 to the form of a common (or vulgar) fraction, and then reduce it to its lowest terms.

347. Find the prime factors of the integral part of 70100.3042875.

348. Regarding 20514471 as so many square inches, how many square acres, rods, rods, feet and inches would be the equivalent of this expression?

349. Regarding the fractional part of 2564308.875 as the decimal of a pound avoirdupois, to how many ounces would it be equivalent?

350. Represent the first four figures of 160269.3046875 by the Roman notation.

351. Copy the following bill of items, find the cost of each item, insert it in its proper place on the right, and find the total amount:

ALBANY, May 30, 1871.

Mr. J. B. WOODWORTH,

To A. & E. C. KOONZ, Dr.

To 75 yds. carpeting, @ \$2.50.....\$
" 42 " drugget, @ \$1.87 $\frac{1}{2}$
" 6 mats, @ \$3.25.....
" 18 rugs, @ \$22.30.....
" 81 yds. oilcloth, @ \$1.10.....

\$

Received Payment,

A. & E. C. KOONZ.

352. Suppose that you buy of D. Appleton & Co., of New York, 5 reams of note paper, at \$3.25 per ream; 4,500 envelopes, at \$4.75 per M.; 24 boxes of steel pens, at \$1.12 $\frac{1}{2}$ per box; 6 French dictionaries, at \$1.50 each; and 3 photographic albums, at \$5.75 each. Make out the bill in regular form, as in question 351.

353. Suppose that the Messrs. Appleton consent to discount 12 per cent from the amount of the foregoing items, how much would the required payment become?

354. Analyze (or explain in words the method of solving) the following example: If 6 men can do a piece of work in 10 days, how long will it take 5 men to do it? *12*

355. Define Ratio.

356. Define Proportion.

357. Define Rule of Three.

358. Solve the following example by the Rule of Three (or Proportion):

If a railroad car goes 17 miles in 45 minutes, how far will it go in 5 hours at the same rate? *63*

359. J. Ayres had D. Howe's note for \$1,728, dated Dec. 29, 1869; what will be the amount Oct. 9, 1872, at 9 per cent.? *2160*

360. What principal will gain \$5.11, in 3 yr. and 6 mo., at 8 per cent.? *18*

— 16 —

361. Express by figures the number: five trillion eighty billion nine millions and one. *50980000000000000000000000000001*

362. Add the following numbers:

- (1) Two hundred and ten thousand four hundred;
- (2) One hundred thousand five hundred and ten;
- (3) Ninety thousand six hundred and eleven;
- (4) Forty-two hundred and twenty-five;
- (5) Eight hundred and ten. *1640*

363. Taking two hundred and ten thousand four hundred as a minuend, and one hundred thousand five

hundred and ten as a remainder, what will the subtrahend be, expressed in words? ~~100 846~~

364. What is the product of ninety thousand six hundred and eleven, and forty-two hundred and twenty-five? ~~382847~~

365. The quotient of one number divided by another is 37; the divisor, 246; the remainder, 230: what is the dividend? ~~8332~~

366. What is the greatest common divisor of 1649 and 5423? ~~17~~

367. What is the least common multiple (or dividend) of 21, 35, and 42? ~~210~~

368. What is the value of $6\frac{2}{3}$ divided by $8\frac{2}{3}$? ~~2\frac{2}{3}~~

369. How many yards of cloth $\frac{4}{5}$ of a yard wide are equivalent to 12 yards $\frac{3}{4}$ yards wide? ~~11\frac{1}{4}~~

370. Change $\frac{4}{7}$ to an equivalent fraction having 91 for its denominator. ~~3291~~

371. The difference between $\frac{6}{7}$ and $\frac{7}{8}$ of a number is 10: what is that number? ~~360~~

372. What is the sum of $\frac{7}{8}$, $1\frac{7}{12}$, $10\frac{5}{6}$, and 5? ~~18\frac{24}{12}~~

373. What will 4868 bricks cost, at \$4.75 per M.?

374. An open court contains 40 square yards: how many stones, nine inches square, will be required to pave it? ~~640~~

375. Change .0008 to a common fraction. ~~1/1250~~

376. Change $\frac{3}{800}$ to a decimal. ~~.00375~~

377. How many cords of wood could be piled in a shed 50 ft. long, 25 ft. wide and 10 ft. high? ~~125~~

378. How many acres of city land at \$2 per square foot, could be bought for a half million dollars?

379. Change 10 oz. 13 pwt. 9 gr. to the decimal of a pound Troy.

380. A man owning $\frac{4}{5}$ of an iron foundry, sold 35 per cent of his share: what part did he still own?

381. What will be the amount, at simple interest, of \$35.61, from Nov. 11, 1869, to Dec. 15, 1871, at 6 per cent?

382. If the consequent be $\frac{7}{8}$, and the ratio $\frac{3}{4}$, what is the antecedent?

383. At the rate of 9 yards for £5 12s. how many yards of cloth can be bought for £44 16s.?

384. What is the square root of 576.02880036?

— 17 —

385. Add seven hundred and four; sixty thousand four hundred; five million eight thousand and sixty; 912875; thirty thousand and forty-nine; seven hundred and seven thousand nine hundred and six.

386. A. had \$3,958, B. \$1,463; A. lost \$1,365, B. gained \$1,165: which then had the most, and how much?

387. A peddler bought 491 yards of cloth at 81 cts. a yard; he used 29 yards, and sold the rest at 95 cts. a yard: how much did he gain?

388. A city had \$311,205 at the beginning of the year; the income of the year was \$884,743, and the expenses \$896,756: what was the balance on hand at the end of the year?

389. A man exchanged 159 cords of wood at \$5 a cord, for a horse valued at \$144, and the balance in sheep at \$3 apiece: how many sheep did he receive?

390. How many pieces of muslin, each containing 33 yards, must be sold at 14ct. 5 m. a yard to realize \$1,339.80?

391. How many sq. yd. of paving in a street are there, 2700 ft. long and 40 ft. wide?

392. At noon on Thursday, a ship was in north latitude $28^{\circ} 15' 35''$; it then sailed north till Saturday afternoon at 3 o'clock, when it was in north latitude $41^{\circ} 34' 35''$: what was the average motion per hour, in geographical miles?

393. $\frac{7}{8}$ of $\frac{9}{10}$ of $\frac{11}{12}$ of $\frac{8}{9}$ of $\frac{5}{6}$ of $20\frac{4}{7}$ = ?

394. Sold a team for $\$183\frac{4}{5}$, losing $\$24\frac{1}{2}$: for how much should I have sold it to gain $\$39\frac{7}{10}$.

395. A man having $105\frac{3}{4}$ A. of land exchanged $\frac{1}{6}$ of it for wood, at the rate of $10\frac{1}{2}$ C. per A.: how many C. did he receive?

396. Multiply the quotient of $14\frac{2}{3}$, divided by $6\frac{6}{7}$ by the quotient of $5\frac{5}{6}$ divided by $7\frac{7}{11}$.

397. Reduce 9000000 in. to mi.

398. What is the cost of a field 77 rd. long and 41 rd. wide, at \$17.60 an A.?

399. If 4.2 yd. of cloth costs \$15, what will 8 yd. 3 qr. cost?

400. If a loaf weighing $12\frac{4}{5}$ oz. is worth 2 cts., when flour is \$4 a bbl., what is the value of a loaf weighing $10\frac{2}{3}$ oz. when flour is $\$6\frac{2}{5}$ a bbl.?

401. A man bought 350 A. of land for \$40 an acre, and sold a part for \$2,240, at the same rate: what per cent. of the land did he sell?

402. At 6 per cent, what is the interest of \$720 for 3 yrs. 4 mo. 16 da.?

403. Sold 50 bbl. of wine, each containing 31 gal. 2 qt., at \$2.40 a gal., receiving a note at 90 days without grace: what would be the proceeds of this note, discounted at $7\frac{1}{2}$ per cent?

404. A., B. and C. bought a horse for \$100 and sold him for \$150, by which A. gained \$18 and B. \$19: how much had each paid for the horse?

405. A man had a yard 38 ft. long and 27 ft. wide: he reserved two grass plats each 8 ft. square, and had the rest paved with stone, at 45 cts. a sq. yd.: what did the paving cost?

406. The product of two equal factors is 34225: what is each factor?

407. Find the sum of 10 terms of the geometric series, 3, 6, 12, etc.

408. If January 1st is Sunday, how much can a man earn in the first three months of a leap year, at \$1.25 per day, not working Sundays?

— 18 —

409. If the minuend be 69 trillion and the difference 85 billion, what is the subtrahend?

410. If 892 is one factor, and 28544 the product, what is the other factor?

411. Resolve 180 into its prime factors.

412. Find the greatest common divisor of 222 and 564.

413. Reduce 8692 to a fraction whose denominator is 25.

414. What cost $5\frac{1}{8}$ cords of wood at \$7.56 a cord?

415. $\frac{4}{7}$ of $\frac{1}{2}\%$ divided by $\frac{5}{12}$ of $\frac{2}{3}$ of $\frac{2}{3} = ?$

416. A body of 4800 troops has $\frac{1}{3}$ as many cavalry as infantry: what is the number of infantry?

417. $3\frac{1}{4} + 2\frac{5}{8} + 7\frac{8}{12} = ?$

418. The product of three numbers is $74\frac{1}{2}$; two of them are $8\frac{1}{4}$ and $6\frac{1}{3}$: what is the third?

419. Reduce 2 mi. 5 f. 13 r. 4 yd. 2 ft. to inches.
420. What would be the cost of enough oil cloth to cover a room $12 \times 16\frac{1}{2}$ ft. at 75 cents per sq. yd.?
421. At \$198 per lb., what would be the cost of 10 oz. 10 pwt. 10 gr. of gold?
422. What is the difference in time of two places whose longitudes differ 7 degrees, 8 minutes and 4 seconds?
423. Write in figures (the fractional part as *decimal*) the number: seven million and one ten-millionths.
424. 49.2654756 divided by .0750 = ?
425. Reduce .8975 of a week, to whole numbers of a lower denomination.
426. What is the amount of \$1,000 for 7 yr. 10 mo. 18 da., at 6 per cent. simple interest?
427. What is the present worth of \$1,609.30 for 10 mo. 24 da., discounted at 5 per cent?
428. For what must apples, which cost \$1.25, be sold to gain 20 per cent?
429. If \$800 yield \$56 interest in a certain time, what will \$390 yield at the same rate?
430. If a 3-cent loaf weigh 2 oz. when flour is \$7.50 per bbl., what should a 12 cent loaf weigh when flour is \$16 per bbl.?
431. What number expresses the difference between the square and the cube of 24?
432. What is the square root of 253009?

433. Write in figures: twenty quintillion two hundred and seven billion six hundred million six thousand and fifty-nine.

434. Express in words: 224000000600317010.
435. Add 100375, 406780, 4673005, 4112, 18365791, 2478, and 164357.
436. Find the sum (in Roman notation) of LXVI, MDXIX, CCIV, XVIII.
437. The factors of a certain number are 53, 7, 5, and 107: what is that number?
438. 246515999541 divided by 28653 = ?
439. What are the prime factors of 6006?
440. What is the greatest common divisor of 2268 and 344?
441. Find the least common multiple of the 9 digits.
442. Reduce $\frac{2}{3}$, $\frac{4}{5}$, $\frac{1}{2}$, and $2\frac{1}{7}$, to equivalent numbers having the least common denominator.
443. What would be the whole cost of four fields, containing respectively, $4\frac{1}{7}$, $2\frac{1}{2}$, $3\frac{2}{3}$, and $1\frac{3}{8}$ acres, at \$25 an acre?
444. Reduce $\frac{3}{7} \times \frac{7}{8} \times \frac{5}{6} \times \frac{4}{11} \times \frac{11}{12} \times \frac{6}{7} \times \frac{8}{9}$, to a single fraction of the lowest terms.
445. If a man makes $\$1\frac{1}{2}$ on the sale of one table, how many tables must he sell to make $\$27\frac{3}{4}$?
446. A. Barnes, of Lee, sold B. Brown the following articles: April 1, 1872, 24 yd. black silk, at \$2.25 a yd.; April 3, 2 pieces of calico, 40 yds. each, at 30 cts. a yd.; May 2, 4 dress patterns, at \$6.75 a pattern; May 9, $22\frac{1}{2}$ yd. linen, at \$1.12 a yd. Brown paid \$55 on account. Make out his bill in proper form, showing balance due.
447. At 35c. per sq. yd., what would it cost to plaster a wall 15 ft. high and 54 ft. long?
448. How much wood in three piles, the first of

which contains 10 cd. 6 cd. ft. 4 cu. ft., the second, 12 cd. 12 cu. ft.; the third, 17 cd. 1 cd. ft.?

449. Divide the sum of five thousand and two thousandths, by two hundredths.

450. \$10 is 12 per cent of what number?

451. What is the amount of \$2,160 from March 10 to Dec. 1, at 5 per cent?

452. How much must be invested at 7 per cent simple interest to yield an annual income of \$630?

453. A note for \$1,800, payable in 60 days, was discounted at bank at 6 per cent: how much did the holder receive?

454. What cost 9 hats, if 5 hats cost £4, 5s.?

455. If the wages of 6 men for 14 days are \$126, what, at the same rate, would be the wages of 9 men for 16 days?

456. Extract the square root of 6.5536.

— 20 —

457. Write in words the number represented by the figures: 20463162486135.

458. Express in figures: fifty-seven billion fifty-nine million ninety thousand and forty-seven.

459. Add
$$\begin{array}{r} 1234 \\ 765 \quad 89 \\ \hline 210 \quad 54 \\ \hline 678 \end{array}$$

$$\begin{array}{r} 2109 \\ 345 \\ \hline 987 \end{array}$$

$$\begin{array}{r} 102 \\ 3000 \\ \hline 456 \end{array}$$

$$\begin{array}{r} 87 \\ 109 \\ \hline 5432 \end{array}$$

460. From 501505010678 take 794090589.

461. Multiply ninety thousand eight hundred and seven by nine thousand one hundred and six.

462. 18 A. 0 R. 14 p. equal how many square feet?

463. 31557600 seconds equal how many days?

464. From 61 S. $15^{\circ} 36' 15''$ take 53 S. $18^{\circ} 50' 18''$.

465. If 84 loads of hay weigh 201 T. 6 cwt. 0 qr. 12 lb., what will 5 loads weigh?

466. What are the prime factors of 19965?
467. Find the least common multiple of 3, 4, 5, 6, 7, 8.
468. Reduce $\frac{5}{7} \times \frac{3}{15} \times \frac{4}{16} \times 8\frac{3}{4} \times \frac{11}{5}$ to a simple fraction of the lowest terms.
469. Reduce $\frac{4}{9}$, $\frac{2}{3}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$ and $\frac{1}{12}$ to equivalent fractions having the least common denominator.
470. What is the sum of $\frac{3}{4}$, $\frac{5}{6}$, $\frac{2}{3}$, and $\frac{1}{12}$?
471. Divide $116\frac{3}{7}$ by $14\frac{1}{4}$. (Give the answer as a mixed number, with its fraction of the lowest terms.)
472. Reduce $\frac{4}{7}$ of a grain to the fraction of a pound Troy.
473. Paid \$4,355.52 for $49\frac{6}{7}$ pieces of carpeting: what would $37\frac{5}{7}$ pieces cost, at the same rate?
474. Multiply eighty-seven thousandths by fifteen millionths.
475. What decimal fraction is equivalent to $\frac{7}{16}$?
476. What is 5 per cent of \$789?
477. What is the interest of \$1,165.50, for 5 yr. 3 mo. 9 d. at 7 per cent?
478. What is the bank discount on \$780 for 30 days?
479. If A. travels 117 miles in 15 days employing 9 hours a day, how far would he travel in 20 days, travelling 12 hours a day (at the same rate per hour)?
480. What is the square root of 23804641?

— 21 —

481. Write 1873 in Roman characters.
482. What is *Notation*?
483. Write in words 9008007006.
484. To what number must 962 be added three times to make 8472?

485. \$9,843.621 plus \$4,687.32 plus \$84.321 plus \$.07 plus \$.64 plus \$973.241 = ?

486. Reduce 53684" to numbers of higher denominations.

487. Reduce .8975 of a week to whole numbers of lower denominations.

488. What cost $10\frac{3}{5}$ tons of coal at $\$7\frac{5}{6}$ a ton?

489. $108 \div 1\frac{2}{7} \times 1\frac{7}{11} - \frac{2}{3} = ?$

490. Find the least common multiple of 12, 16, and 28.

491. Reduce $1\frac{3}{8}$, $1\frac{2}{7}$, and $8\frac{5}{6}$ to the least common denominator.

492. A cubic foot of granite weighs 163 lb. 5 oz.: what is the weight of a block 3 ft. $2\frac{2}{5}$ in. long, 2 ft. 4 in. wide, and 1 ft. 3 in. thick?

493. How many linear yards of carpeting $1\frac{1}{2}$ yd. wide will cover a floor 18 ft. square?

494. When snow is uniformly 6 inches deep, how many cubic feet are there on one acre of land?

495. Charles Fuller bought of James Monroe, at West Troy, N. Y., May 4, 1873, 1 horse for \$95, 2 cows at \$50 each, 1 wagon for \$62, 2 shovels at \$1.12 each and 30 bushels of corn at \$0.65 per bushel, paying cash in full. Make the bill in due form.

496. A cistern can be emptied by 7 pipes of equal capacity in 35 minutes: in what time can it be emptied if only 5 pipes are open?

497. If 12 per cent of \$97.50 be lost what amount will remain?

498. What is the simple interest of \$200 for 4 yr. 6 mo. 3 d., at 7 per cent?

499. Find the bank discount of \$1,000 for 3 mo. at 7 per cent.

500. If 9 lb. of lead make 150 bullets, how many bullets can be made from 105 lb.?

(Solve by proportion and cancellation.)

501. If the wages of 75 boys for 84 days were \$68.75, how many days could 90 boys be employed at the same rate, for \$41.25?

(Solve by double proportion.)

502. What is the difference between the square and the cube of 24?

503. What is the square root of 253009?

504. $\frac{1}{8}$ of a number exceeds $\frac{1}{4}$ of it by 20: what is that number?

— 22 —

505. Find the sum $\frac{3}{4}$ of $9\frac{3}{5}$ and $\frac{4}{5}$ of $28\frac{1}{6}$.

506. Find the difference between $3\frac{3}{4} + 7\frac{3}{5}$ and $4 + 2\frac{3}{7}$.

507. The product of three factors is $19\frac{1}{2}$, and two of them are $\frac{4}{3}$ and $\frac{5}{8}$: what is the other?

508. Divide .5 of 1.75 by .25 of $17\frac{1}{2}$.

509. What is the value of $6\frac{2}{9}$ divided by $8\frac{2}{3}$, as a simple fraction?

510. What is the value of .815625 of pound Troy expressed in oz. pwt. and gr.?

511. Reduce 4 da. 4 hr. 48 mi. to the decimal of a week.

512. A person owned $\frac{5}{8}$ of a mine and sold $\frac{2}{3}$ of his interest for \$1,710: find the value of the entire mine.

513. Sold $9\frac{2}{5}$ cwt. of sugar at \$8 per cwt., and thereby lost 20 per cent: what was the whole cost?

514. A man owning $\frac{4}{5}$ of a bank, sold 35 per cent of his share: what per cent of the whole was left?

515. A.'s property is assessed at \$6,750, and B.'s at \$13,550. A.'s tax is \$55.35: how much is B.'s?

516. How many acres can 10 men plough in 14 hours if 7 men plough 6 acres in $12\frac{1}{2}$ hours?

517. What is the simple interest on \$200 for 3 yr. 10 mo. at 7 per cent?

518. In 1 yr. 4 mo., \$311.50 amounted to \$348.88, at simple interest: what was the rate per cent?

519. What is the amount of \$1,000 for 7 yr. 10 mo. 18 da., at 6 per cent simple interest?

520. What sum, at 9 per cent, simple interest will amount to \$286.00, in 3 yr. 4 mo.?

521. A note for \$470.66 drawn at 60 days, is discounted at bank at 6 per cent: what are the proceeds?

522. What is the amount of \$50, at compound interest for 3 yr. at 8 per cent, interest payable half-yearly?

523. J. Ayres has D. Howe's note for \$1,728, dated Dec. 29, 1869: what was the amount Oct. 9, 1873, at 9 per cent, with interest from date?

524. What is the value in currency of \$865 in gold, when the latter is selling at 107 per cent?

525. How much gold will \$100 currency buy, gold being at 111?

526. Suppose that you buy of D. Appleton & Co., of New York, 5 reams of note paper, at \$3.25 per ream; 4,500 envelopes, at \$4.75 per M.; 24 boxes of steel pens, at \$1.12 $\frac{1}{2}$ per box; 6 French dictionaries, at \$1.50 each; and 3 photographic albums, at \$5.75 each. Make a bill for D. Appleton & Co., against yourself, in regular form.

527. A man had a yard 38 ft. long and 27 ft. wide; he reserved two grass plats, each 8 ft. square, and had

the rest paved with stone, at 45 cts. a sq. yd.: what did the paving cost?

528. How much will it cost to dig a cellar 40 ft. long, 32 ft. wide, and 5 ft. deep, at \$0.25 a cubic yard?

— 23 —

529. Find the smallest number which will exactly contain 9, 15, 18, 20.

530. If 5 be added to each term of the fraction $\frac{2}{3}$, by what number will its value be diminished? $\frac{5}{3}$

531. If .0001 is the dividend, and 1.25 the divisor, what is the quotient?

532. What will 28 sq. yd. 129 sq. ft. of land cost at 12 cts. per sq. ft.? 611.60

533. What is the cost of 4,565 feet of joist, at \$23 per M., and 13,640 ft. of boards at \$53.55 per M.? 35741.75

534. If $32\frac{2}{3}$ sq. yd. of carpeting will cover a floor 14 ft. wide, what is the length of the floor?

535. If a load of wood is 8 ft. long and 3 ft. wide, how high must it be to contain a cord? $5\frac{1}{3}$

536. What decimal of a short ton is $\frac{5}{8}$ of an oz.? $.0000139$

537. $20004 + (20.104 \times 5.07) - (6.44 \div .0005) = ?$ 792

538. What part of $2\frac{2}{3}$ is ($\frac{3}{4}$ of $\frac{2}{3}$ of $\frac{2}{5} \div \frac{2}{3}$)?

539. Reduce .3945 of a day to lower denominations.

540. An agent received \$67.50 for collecting \$4,500: what was the rate per cent of his commission? $4\frac{1}{2}$

541. How many cubic ft. in a rectangular beam, 24 ft. 6 in. long, 1 ft. 9 in. wide, and 1 ft. $2\frac{1}{2}$ in. thick?

542. How much shall I gain by borrowing \$3560 for 1 yr. 6 mo. 10 da., at 6 per cent, and lending it at 7 per cent for the same length of time?

543. What is the amount of \$1,450.40 from April 19, 1872, to August 3, 1873, at 6 per cent?

544. What is the difference between the greatest common divisor of 30 and 42, and their least common multiple?

545. A 63 gal. cask is $\frac{3}{5}$ full of wine; if 27.625 gal. should leak out, the wine remaining will be what decimal part of the full cask?

546. James Riley & Co. bought, July 7, 1873, of Joseph Herr, Trenton, N. J., 15 tons of coal at \$6.50 per ton; 19 tons of coal at \$8.25 per ton; and $14\frac{1}{2}$ cords of wood at \$5.20 per cord. Make a bill of the purchase, and receipt it for Joseph Herr.

547. How much must be paid for 41 gal. 2 qt. $1\frac{3}{4}$ pt. of molasses, at 72 cts. a gal.?

548. If $1\frac{1}{2}$ of a ton of hay cost \$18.50, how much will two loads cost, one weighing $\frac{5}{6}$ of a ton, and the other $\frac{23}{4}$ of a ton?

549. What is the difference between the true and the bank discount of \$300, for 3 months, at 8 per cent?

550. What principal on interest at 7 per cent from April 9, 1871, to Sept. 5, 1873, will amount to \$1,477.59?

551. The difference between the interest of \$600 and that of \$750, at 5 per cent for a certain time is \$18.75. What is the time?

552. If 18 men can dig a trench 30 yd. long in 24 da. by working 8 hr. a day, how many men can dig a trench 60 yd. long, in 64 da., working 6 hours a day?

553. What is the sum of 3912, 400005, $631\frac{2}{3}$, 736863, .000803, 60708010, $4\frac{4}{1000}$, 290.68042?

554. Subtract $\frac{4}{5}$ of $9\frac{3}{4}$, from $\frac{5}{21}$ of $151\frac{1}{5}$.
555. What will 250 miles of telegraph wire cost at 3 cts. per ft.?
556. When it is noon at the Cape of Good Hope, in longitude $18^{\circ} 24'$ east, what is the time at Cape Horn, in longitude $67^{\circ} 21'$ west?
557. How many cords of wood in a pile 140 ft. long, $4\frac{1}{2}$ ft. wide, and $6\frac{1}{2}$ ft. high?
558. Required the area in acres, etc., of a piece of land .5 of a mile long, and .3 of a mile broad.
559. How much will it cost to dig a cellar 40 ft. long, 32 ft. wide, and 5 ft. deep, at \$0.25 a cubic yard?
560. $\frac{1}{5}$ of a qr. is what per cent of $\frac{2}{5}$ of a cwt.?
561. Reduce $\frac{7}{8}$ lb. Troy to units of lower denominations.
562. How much gold will \$100 currency buy, gold being at 113?
563. In 1 yr. 4 mo., \$311.50 amounted to \$336.42, at simple interest: what was the rate per cent?
564. What sum, at 7 per cent, simple interest, will amount to \$221.07, in 3 yr. 4 mo.?
565. A note for \$470.66, drawn at 60 days, is discounted at bank at 6 per cent: what are the proceeds?
566. What is the amount of \$50, for 2 yr., at 8 per cent, compound interest, payable half-yearly?
567. The four sides of my garden are 168 ft., 280 ft., 182 ft., and 252 ft., respectively. What is the greatest length of boards that I can use in fencing it, without cutting any of them?
568. A garden has 4 sides, respectively 168, 280, 182, and 252 ft. long. Suppose that each board is 8 in.

wide, and that the fence is 5 boards high: how many sq. ft. of boards will it require to fence the garden?

569. Suppose that you sell to John Clarke of New York for cash, 75 yd. of carpet, \$1.55 per yd.; 30 yd. drugget, at \$1.30 per yd.; 5 mats at \$3.15 each; and 35 yd. of oil cloth, at \$1.05 per yd. Make a receipted bill of these articles, in regular form.

570. What is the value of $(\frac{2}{3} \times \frac{5}{8} + 3\frac{2}{7}) \div \frac{23}{84}$?

571. What is the least number that 8, 12, and 16 will each divide without remainder?

572. What will 11 lb. 4 oz. of tea cost, if 3 lb. 12 oz. cost \$3.50?

(Solve by proportion.)

573. If a man travels 107 miles in 15 days, employing only 9 hours a day, how far would he go in 20 days, travelling 12 hours a day, at the same rate per hour?

574. What debt can be discharged in a year by weekly payments in arithmetical progression, the first being \$24, and the last \$1,224?

575. What is the length in feet and inches, of each side of a square carpet, made from $208\frac{1}{3}$ yds. of Brussels carpeting, $\frac{3}{4}$ yd. wide?

576. What is the length of the side of a cubical box which contains 389017 solid inches?

— 25 —

577. Find the sum of the following numbers, arranging them properly for addition: 14.2351; 651.012; 2.219; .0374; .00146.

578. Multiply 4.44; 5.555; 6.23; .5.

579. Divide 6.435945 by 4027.5.

580. Find the sum of $16\frac{1}{5}$, $2\frac{1}{5}$, and $\frac{8}{3}\frac{1}{5}$.

581. Find the product of $\frac{16}{21}$, $\frac{7}{8}$, and $\frac{3}{17}$.
582. If $3\frac{3}{4}$ bu. of oats cost \$ $2\frac{3}{8}$, what will 2 bu. cost?
583. Resolve 122,850 into its prime factors.
584. Find the greatest common divisor of 195, 285, and 315.
585. Find the least common multiple of 49, 14, 84, 168, and 98.
586. Sold 2,462 feet of boards, at \$ 7.25 per 1000
 " 600 " scantling, " 11.75 " 1000
 " 1,012 " plank, " 1.25 " 100
 " 77 " hewn timber " .15 " foot

Write a bill of the same and receipt it. The seller may be John Smith, and the buyer James Brown.

587. What part of $\frac{7}{9}$ of a mile is $4\frac{3}{4}$ rods, expressed in decimals?
588. The longitude of New York city is $73^{\circ} 58' 54.43''$ W.; of Buffalo, $78^{\circ} 53' 25''$ W. What is the difference of time?

589. Write the rule for multiplication of decimals.
590. Write the rule for division of decimals.
591. Define *ratio*, state how it may be expressed, what each term is called, and give an example.
592. The same of *proportion*.
593. What is either *extreme* of a proportion equal to? What either *mean*?
594. What is the simple interest on \$2,500 for 1 yr. 8 mo. 12 da., at 7 per cent?
595. A. has a note against B. for \$1,728, payable 90 days after date, without interest, which he gets discounted at bank at the rate of 7 per cent: what does he receive?
596. Extract the sq. root of 1104601.

597. If a man can do a piece of work in 20 days, working 10 hours a day, how long will it take him to do the same if he works 12 hours a day?

(Solve by proportion.)

598. A farmer puts a flock of sheep in three pastures; in the first he puts $\frac{1}{3}$ of his flock, in the second $\frac{1}{2}$, and in the third, 32 sheep. How many has he?

(Solve by analysis.)

599. Find 12 per cent of $\$1\frac{1}{2}$.

600. A commission merchant sold 500 pieces of muslin, each piece containing 21 yards, for 23 cents a yard: what is his commission at $2\frac{1}{2}$ per cent?

— 26 —

601. The population of Me. is 627,413; of N. H., 301,471; of Vt., 300,187; of Mass., 1,240,499; of Conn., 410,749; of R. I., 192,815. What is the aggregate population of these States?

602. B. had \$12,311; and after paying his debts, and giving away \$2,108, he has \$8,199 left. What was the amount of his debts?

603. How many peaches in an orchard of 14 rows of trees, each row having 27 trees, and each tree 108 peaches?

604. How many cheeses of 45 lb. each, at 12 cts. per lb., will pay for 15 bbl. of apples, each containing 3 bu., at 84 cts. per bu.?

605. Add $8\frac{8}{13}$, $\frac{2}{3}\frac{9}{10}$, and $\frac{5}{6}\frac{2}{5}$.

606. What cost $33\frac{1}{2}$ lb. of tea, at $93\frac{3}{4}$ cts. per lb.?

607. $100\frac{2}{3}\frac{7}{10} \div 66\frac{2}{3} = ?$

608. Write as a decimal, and in words, $\frac{1}{1000000}$.

609. $6.43875 \div 4027.5 = ?$

610. Anna Lee buys of Eva Cole, for cash, 18 yd. of calico, at $12\frac{1}{2}$ cts. per yd.; 12 yd. muslin, at 17 cts.; $2\frac{1}{2}$ yd. linen, at 74 cts.; and 9 spools of thread, at 7 cts. Make a bill in due form.

611. What decimal part of a mile is 74 rd. 5 yd.?

612. The circumference of one carriage wheel is 13 ft. 9 in., and that of another is 16 ft. 6 in. How many more times will one turn than the other, in going 30 miles?

613. What cost 8,824 lb. of hay, at \$15 per ton?

614. The *means* and *one extreme* of a proportion being given, how may the *other extreme* be found?

615. The *extremes* and *one mean* being given, how may the *other mean* be found?

616. Give an example of a proportion in which the means and one extreme are given, and solve it.

617. Give an example of a proportion in which the extremes and one mean are given, and solve it.

618. If 20 yd. of cloth $\frac{3}{4}$ of a yd. wide are required for a dress, what must be the width of a piece 12 yd. long, to answer the same purpose?

(Solve by proportion.)

619. If a man can walk 250 mi. in 9 da. of 12 hr. each, how many da. of 10 hr. each would he spend in walking 400 mi.? (Solve by double proportion.)

620. A boy bought eggs at the rate of 3 for 5 cts., and sold them at the rate of 4 for 7 cts., clearing 9 cts.: how many did he buy? (Solve by analysis.)

621. A commission merchant sold 500 pieces of cloth for \$30 a piece, and paid the owner \$14,700: what was the rate of his commission?

622. A store was insured for \$12,000 at the rate of $\frac{3}{4}$ per cent, and the goods for \$15,000, at $1\frac{1}{4}$ per cent: what was the entire premium?

623. What will be the proceeds of a note for \$1,000, without interest, payable at bank in 60 days, at 6 per cent?

624. A man being asked his age, replied, if you add to its half, its third and three times three, the sum will be 130: what was his age?

— 27 —

625. The quotient is 71, the divisor 42, and the remainder 15: what is the dividend?

626. What will be the cost of 3,760 lb. of hay at \$8.50 per ton?

627. From $17\frac{1}{2}$ take $\frac{3}{5}$ of $16\frac{1}{4}$, and multiply the remainder by $\frac{2}{3}$.

628. A lady bought 6 silver spoons, each weighing 3 oz. 3 pwt. 8 gr., at \$2.25 an oz., and a gold chain weighing 14 pwt., at \$1.25 a pwt.: what was the cost of both spoons and chain?

629. From 15 ten-thousandths take 27 millionths, and multiply the difference by 20.5.

630. Reduce 6.25 of a pound Troy to lower integers.

631. How many seconds are there in the three summer months?

632. How many acres are there in a street 4 rods wide, and $2\frac{1}{4}$ miles long?

633. Reduce 4 s. 6d. to the decimal of a £ sterling.

634. A quantity of sugar was bought for \$150, and sold for \$167.50: what was the gain per cent?

635. Mrs. C. B. Jones bought of Cole, Steel & Co.,

of Detroit, as follows: Nov. 12, 1874, 23 yd. calico, @ 16c.; 45 yd. sheeting, @ 20c.; Dec. 7, 12 yd. silk @ \$1.62 $\frac{1}{2}$; 8 handkerchiefs, @ 45c.; 2 pairs kid gloves, @ \$1.87 $\frac{1}{2}$. Make bill for Jan. 1, 1875, and receipt the same, as clerk of the firm.

636. What is the interest of \$125.50 for 7 mo. 10 da. at 7 per cent?

637. A note for \$500, dated Oct. 8, 1873, and bearing interest at 9 per cent, is endorsed as follows: Nov. 4, 1874, \$36; Jan. 30, 1875, \$250. What will be due July 1, 1875?

638. What is the true discount on \$236, due in 3 years, at 6 per cent?

639. What is the bank discount on \$125 payable in 90 days, at 8 per cent?

640. Two men divided a lot of wood costing \$81, one taking $5\frac{1}{2}$ cords, and the other the remaining 8 cords: what must each pay? (Solve by analysis.)

641. What is the square root of 416.16?

642. How many gallons of water will a cistern hold which is 7 ft. long, 6 ft wide, and 11 ft. deep?

643. A. can mow 2 acres in 3 days, and B. 5 acres in 6 days: in how many days can they together mow 9 acres?

644. A house valued at \$3,240 is insured for $\frac{2}{3}$ of its value, at $\frac{3}{4}$ per cent: what is the premium?

645. How many bricks will it require to build a wall 2 rd. long, 6 ft. high, and 18 in. thick, each brick being 8 in. long, 4 in. wide, and $2\frac{1}{2}$ in. thick?

646. If the wages of 24 men for 4 days are \$192, what will be the wages of 36 men for 3 days?

(Solve by double proportion and cancellation.)

647. At what rate per cent will \$311.50 amount to \$337.40 in 1 year, 4 mo.?

648. What will it cost to lay a pavement 36 ft. long, and 9 ft. 6 in. wide, at 40 cts. a sq. yd.?

— 28 —

649. Express in words the number: 42567000129301.

650. Multiply five hundred and forty thousand six hundred and nine, by seventeen hundred and fifty.

651. Give the rule for reduction ascending (*i. e.* from lower to higher denominations), and state how this process chiefly differs from reduction descending.

652. How many steps of two and one-half feet each, would a man take in walking five miles?

653. How is a whole number reduced to a fraction of the same value, having a given denominator?

654. What is the value of $\frac{2}{3}$ of $\frac{2}{3}$ of $\frac{1}{4}$ of $\frac{1}{2}$, when reduced to a simple fraction of the lowest terms?

655. Give the rule for reducing several fractions to equivalent fractions having the least common denominator.

656. Add $3\frac{2}{3}$, $4\frac{2}{3}\frac{1}{8}$, and 51.652. (Express the fractional part of the sum as a *decimal* of three places.)

657. Write in figures: two and six hundred-millionths.

658. Reduce $\frac{7}{8}\frac{7}{25}$ to the equivalent decimal form.

659. Multiply seven thousand and five, by three-hundred-and-five-millionths.

660. Divide .5 of 1.75 by .25 of $17\frac{1}{2}$.

661. If 27 T. 3 qr. 15 lb. of coal cost \$217.83, what will 119 T. 1 qr. 10 lb. cost? (First reduce qrs. and lbs. to the decimal of a ton; and then solve by proportion.)

— 29 —

673. Two men are 450 miles apart; if they approach each other, one traveling 30 miles a day and the other 35 miles a day, how far apart will they be at the end of 6 days?

674. A. had \$24, B. four times as much as A. less \$16, and C. twice as much as A. and B. together plus \$17: how much money had C.?

675. Give all the prime numbers below 20; and all the composite numbers between 20 and 40 inclusive.

676. What is the greatest common divisor of 144, 216, and 648?

677. Reduce to the simplest form $(20\frac{5}{9} + \frac{1}{3} \text{ of } \frac{5}{6}) \div 6\frac{1}{2} - \frac{5}{8} \times \frac{2}{3}$.

678. The longitude of New York being 3° E. from the meridian of Washington, San Francisco $45^{\circ} 25'$ W., what will be the time of day at New York, when it is noon at San Francisco?

679. 2 pk. 3 qt. 1.2 pt. is what decimal part of 20 bu.?

680. What will it cost to dig a cellar 40 ft. long, 21 ft. 6 in. wide, and 4 ft. deep, at \$1.75 a cubic yard?

681. From 16 ten thousandths take 27 millionths and multiply the difference by 20.5.

682. Henry Smith bought of John Clarke, of Louisville, Ky., as follows: Dec. 10, 1875, 7 pair calf boots @ \$5.75; 6 pair ladies' gaiters @ \$3.25; 10 pair children's shoes @ \$1.75; Jan. 5, 1876, 12 pair coarse boots @ \$3.12 $\frac{1}{2}$. Make out and receipt the bill, as clerk of John Clarke.

683. A clerk receiving a salary of \$950, pays \$275 a

year for board, \$180 for clothing, and \$150 for other expenses: what per cent of the salary is left?

684. Carriages costing \$165 are sold at 18 per cent profit; what is the gain on each carriage?

685. A school house is insured at $\frac{3}{5}$ per cent and the premium was \$93.60: for how much is the house insured?

686. If a man's pulse beat 300 times in 4 minutes, how many times will it beat in 8 hours? (Solve by proportion.)

687. If it cost \$84 to carpet a room 36 ft. long and 21 ft. wide, what will it cost to carpet a room 33 ft. long and 27 ft. wide? (State and solve as a compound proportion.)

688. At what date will a note for \$300, given Jan. 10, 1876, amount to \$347.25, at 6 per cent simple interest?

689. A note for \$520, dated April 12, 1874, had the following endorsement: "Dec. 6, 1874, \$120." What amount will be due May 1, 1876, at 9 per cent, simple interest?

690. What is the square root of $1040\frac{1}{16}$?

691. A flag pole 180 ft. high casts a shadow 135 ft. in length: what is the distance from the top of the pole to the end of its shadow?

692. A block of granite in the form of a cube contains 41063.625 cubic inches; what is the length of its edge?

693. The Erie Railway is 460 miles long, and cost \$65,000 a mile: if \$9,645,635 had been paid, how much would remain unpaid?

694. How many lb. of butter, at 33 cts. a lb., can be bought for 55 lb. of tea, at 78 cts. a lb.?

695. What is the sum of twenty-nine and three tenths, four hundred and sixty-five, and two hundred and twenty-one thousandths? (Give the answer in *figures* and also in *words*.)

696. If I own $\frac{5}{7}$ of a farm, and sell $\frac{2}{3}$ of my share for \$2,300, what is the value of the whole farm at the same rate?

697. Find the factors of .035, and multiply .007853 by these factors.

698. Reduce 15 cwt. 3 qr. $2\frac{1}{2}$ lb. to the decimal of a ton.

699. Reduce $\frac{347}{2560}$ to a decimal (of 9 places).

700. The four walls of a room are each 16 ft. in length and 9 ft. in height, and the ceiling is 16 ft. square: how much will it cost to plaster it, at 14 cts. a sq. yd?

701. A merchant failing in trade, pays 65 cts. on each dollar owed; he owes A. \$2,750, and B. \$1,975; how much does he pay each?

702. Paid \$41.62 $\frac{1}{2}$ for a pile of wood, at the rate of \$3.37 $\frac{1}{2}$ a cord: how much was there in the pile?

703. A steamship, in crossing the Atlantic, has 3,500 miles to go: if she sails 211 mi. 4 fur. 32 rd. a day, what distance, after 15 da., has she still to sail?

704. How many sq. ft. are there in a board 17 ft. 6 in. in length, and 1 ft. 7 in. in width?

705. A pasture of a certain extent supplies 30 horses for 28 days: how long will the pasture supply 21 horses? (Solve by proportion.)

706. If 4 bbl. of flour cost \$34 $\frac{2}{3}$, how much can be bought for \$182? (Solve by analysis.)

707. How much hay will 32 horses eat in 120 days, if 96 horses eat $3\frac{3}{4}$ T. in $7\frac{1}{2}$ weeks? (Solve by compound proportion.)

708. What is the simple interest of \$2,594.20 for 10 mo. 9 da., at $7\frac{1}{2}$ per cent?

709. What is the compound interest of \$1,250, for 2 yr. 3 mo. 24 da., compounded annually, at 6 per cent?

710. What is the bank discount on a note for \$556.27, payable in 60 days, discounted at 6 per cent?

711. Two merchants enter into partnership. One puts in \$5,000 and the other \$2,000. The partner that puts in the less sum is to receive \$300 extra from the proceeds for his superior knowledge of the business. They gain \$4,725: what is the share of each?

712. What is the 3d power of 8.628?

— 31 —

713. How many figures are in each of the periods into which numbers are divided for reading?

714. Name the first four periods of integers, and the first three orders (or places) of decimals.

715. Write in figures the number: One million one thousand one hundred and one.

716. Write in figures the numbers: Forty-seven, three hundred and fifty thousandths, forty-two millionths, two hundred and twenty-three billionths.

717. Multiply 732.53 by 37.846.

718. Divide 6052.74 by 4.379.

719. Bought a box of soap containing 70 lbs. Keeping it all summer, it dried away $\frac{1}{3}$, when I sold it at $8\frac{2}{3}$ cts. per pound. I gave 7 cts. per pound. Did I make or lose? How much?

720. If 20 men require $7\frac{1}{2}$ bbl. of flour for their subsistence five months, how much will 30 men require for a year?

721. What is the value of $\frac{1}{11}$ of $\frac{1}{12}$ of a vessel, if a person who owns $\frac{3}{11}$ of it sells $\frac{1}{3}$ of $\frac{7}{8}$ of his share for \$1,750?

722. Write the following numbers in the decimal form, and then add them: $6\frac{1}{4}$, $12\frac{1}{2}$, $5\frac{3}{8}$, $6\frac{5}{8}$, $\frac{3}{5}$, $\frac{3}{4}$.

723. Multiply 5 da. 15 hr. 13 m. 20 s. by 341.

724. Allowing a person to perform a certain journey in $13\frac{1}{2}$ days, by travelling 10 hours a day, in what time ought he to perform the journey if he travel $11\frac{1}{4}$ hours per day?

725. What is the cost of a load of hay weighing 1,875 lb., at \$12.50 per ton (2000 lbs.)?

726. What ought eggs to be per pound, when they are selling at $18\frac{3}{4}$ cts. per dozen, if they average $9\frac{1}{2}$ eggs to a pound?

727. How many cords in three piles of four ft. wood, the first 36 ft. long and 4 ft. high, the second 42 ft. long and 5 ft. high, and the third 20 ft. long and 6 ft. high?

728. What would it cost to enclose a square lot containing 160 acres, with a fence costing at the rate of \$4 per rod?

729. A note of \$65.80, dated Feb. 20, 1868, and bearing interest at 7 per cent, was paid June 25, 1870: what was the amount paid?

730. What is the amount of \$152 at semi-annual compound interest for 2 years, at 6 per cent per annum?

731. What is the annual premium on a policy which

insures a house worth \$12,000 for $\frac{5}{6}$ its value, at $\frac{1}{2}$ per cent?

732. Amount \$102.81, on \$74.50, at 10 per cent. What is the time?

— 32 —

733. Name the first six periods in numeration.

734. Express in figures: one trillion six thousand.

735. 1 million 400 thousand and $50+15$ hundred + 25 thousand + 120 thousand 6 hundred and 14 = ?

736. The subtrahend is 2603.46, and the remainder is 72.804; what is the minuend?

737. The factors of a number are 7300.96 and 5.006; what is the number?

738. The dividend is 39314.76, and the quotient is 7.071; what is the divisor?

739. What operations may be performed on the terms of a fraction without altering its value?

740. If the numerator be equal to the denominator, what is the value of the fraction?

741. How does multiplying the numerator affect the value of the fraction?

742. How does multiplying the denominator affect the value of the fraction?

743. Change $12\frac{1}{4}$ to an improper fraction.

744. Reduce $\frac{3}{4}$ of $\frac{4}{6}$ of $\frac{7}{10}$ of $1\frac{5}{7}$ to a simple fraction.

745. Multiply $\frac{8}{15}$ of $12\frac{1}{4}$ by $\frac{1}{5}$ of $7\frac{1}{3}$.

746. Divide $\frac{3}{4}$ of $1\frac{1}{2}$ by $\frac{2}{3}$ of $\frac{1}{2}$.

747. In what terms of multiplication may equal factors be cancelled?

748. In what terms in division may equal factors be cancelled?

749-750. A note for \$250, dated June 5, 1874, was paid Feb. 14, 1875, with simple interest at 8 per cent. What was the amount? (Two credits.)

751. What is Ratio?
752. How is Ratio expressed?
753. What is Proportion.
754. How is Proportion expressed?
755. What are the 1st and 3d terms of a Proportion called?
756. What are the 2d and 4th terms of a Proportion called?
757. What are the extremes of a Proportion, and what the means?
758. Given the means and one extreme of a Proportion, how may the other extreme be found?
759. Given the first, second and fourth terms of a Proportion, how may the third be found?
760. In the question: If 4 tons of coal cost \$24, what will 12 tons cost, what is the given ratio?
761. If 4 tons of coal cost \$24, what will 12 tons cost?
(Solve by proportion.)
762. Change $\frac{4}{7} = \frac{12}{1}$ to the form of a proportion.
- 763-764. Albany is $73^{\circ} 44' 50''$ West Longitude: San Francisco is $122^{\circ} 26' 45''$. When it is noon at Albany, what is the time at San Francisco? (Two credits.)
765. What will \$864.50 amount to in two years at 8 per cent. compound interest?
766. If 10 tons of hay will support 5 horses 8 mo., how many horses will 18 tons support one year? (Solve by double proportion.)
767. How many men will be required to build 32 rods

of wall in the same time that 5 men will build 10 rods?
(Solve by analysis.)

— 33 —

768. What are the 3 terms in *multiplication* called?
769. What are the 3 terms in *division* called?
770. What are the first and second terms in multiplication taken together called?
- 771-772. To what terms in multiplication do the terms in division correspond?
773. How many partial products will there be, if the multiplier consists of several figures?
774. Given 73654 a multiplicand, and 4365 a multiplier, give each successive multiplier, *expressed in words*; (775) express each partial product *in words*; (776) arrange these products properly in figures for addition, and find the entire product.
777. To what, in division, does the numerator of a fraction correspond?
778. To what, in division, does the denominator of a fraction correspond?
779. If a cubic foot of limestone weigh 175 lb., what is the weight of a cubic yard?
780. What part of an acre is $\frac{7}{9}$ of a square rod?
781. Find the greatest common divisor of 72, 96, 120, 384.
782. Divide 6525 by 4.35.
783. Add $\frac{1}{2}$, $\frac{2}{3}$, $\frac{4}{13}$, $\frac{9}{17}$.
784. Find the product of $\frac{8}{15} \times 12\frac{1}{4} \times \frac{1}{5} \times 7\frac{1}{3}$.
785. Divide $\frac{2}{3}$ of $2\frac{1}{2}$ by $\frac{5}{3}$ of 3.
786. Reduce to an equivalent decimal $\frac{1}{3\frac{1}{2}\overline{0}}$.

787. If $10\frac{1}{2}$ cords of wood cost \$34.12 $\frac{1}{2}$, what will $60\frac{2}{3}$ cords cost? (Solve by analysis.)

788. How much carpeting $\frac{2}{3}$ of a yard wide, is required for a room 27 ft. 3 in. long and 22 ft. 6 in. wide?

789. In multiplication of decimals, how is the place of the decimal point in the product determined?

790. In division, how is the place of the decimal point in the quotient determined?

791. At \$1.20 per gallon, what cost 1 bbl. 15 gal. 3 qt. of molasses?

792. Reduce 28 rd. 4 yd. 2 ft. 10 in. to inches.

793. What per cent of \$4 are 30 cents?

794. Sold 160 acres of land for \$4,563.20, which was 8 per cent less than it cost: what did it cost per acre?

795. What is the simple interest of \$137.25 for 2 yr. 7 mo. 14 da. at 7 per cent?

796. A note for \$250, dated June 5, 1874, was paid Feb. 14, 1875, with interest at 8 per cent. What was the amount?

797. Bought two horses for \$420, paying \$48 more for one than the other. Find the price of each.

798-799. Boston is $71^{\circ} 4' 2''$ W. longitude, and Washington $77^{\circ} 1' 30''$. When it is noon at Boston, what is the time at Washington? (Two credits.)

800. If 2375 A. 2 R. 16 rd. of land be laid out in the form of a square, what will be the length of each side?

801. A. has \$4,000, B. \$2,700, C. \$2,300 in a house renting for \$720: what is each man's share of rent?

802. What is the present worth of \$2,000 due in 3 yr. 6 mo., with interest at 7 per cent?

—34—

803. In the decimal notation, why is the *nought* (0) used, which of itself has no value?

804. Why does (0) annexed to the decimal not change its value?

805. What is the difference between a common and a decimal fraction?

806. A man gave 503 acres of land to his sons, giving them $83\frac{1}{2}$ acres each: how many sons had he? *a 200s*

807. What is the value of a fraction multiplied by its denominator?

808. If 14 acres of meadow yield $32\frac{2}{3}$ tons of hay, what will $5\frac{1}{2}$ acres produce at the same rate?

809. Change 4, 2.17, .136, and .0408 to equivalent decimals having a common denominator. (810.) Find their sum.

811-12. A farmer sold 300 bu. of oats at \$0.45 a bu. and $16\frac{2}{3}$ cords of wood at $\$3\frac{1}{2}$ a cord. He received in payment 125 lb. of sugar at $\$0.12\frac{1}{2}$ a lb., 36 lb. of tea at $\$1\frac{1}{2}$ a lb., 6 bbl. of flour at $\$8.37\frac{1}{2}$ a bbl., and the rest in cash. How much cash did he receive?

813. Divide 100 by .001.

814. What is the cost of 536720 bricks, at \$8.75 per M.?

815. How many coats can be made from 32.4 yds. of cloth, allowing 2.7 yds. for each coat?

816. Find the prime factors of 2205.

817. Divide 375287 by 46; (818) write the several parts into which the dividend is separated in the process of division, each exactly containing the divisor; (819) show that the sum of these parts with the remainder

(if any) equals the dividend; and (820) that the sum of the several quotients expresses the whole quotient.

821. Find the greatest common divisor in 72, 126, 216.
822. What is Percentage?
823. How may the percentage of a number be found?
824. Mention three arithmetical operations in which percentage is used.
825. What is the interest on \$4,010 for 1 yr. 1 mo. 13 da. at 7 per cent simple interest?
826. What is the commission on the sale of a house for \$9,346.80, at $6\frac{1}{4}$ per cent?
827. If \$4.30 is paid for an insurance of \$860, what is the rate?
828. In a proportion, the two extremes and one mean being given, how may the other mean be found?
829. In what terms of a proportion may equal factors be cancelled?
830. If a man walk 192 mi. in 6 da., walking 8 h. a day, how far can he walk in 18 days, walking 6 hours a day? (Solve by compound proportion.)
831. If 251 A. 65 P. of land are laid out in form of a square, what will be the length of each side?
832. How many sheets of tin each 14x22 in., will it take to cover a roof, 30 ft. x 18 ft. 4 in.?
- 833-837. At \$0.36 per sq. yd., for plastering, and \$0.75 per roll for paper hanging, how much will it cost to plaster the walls and ceiling, and paper the walls of a room 18x16x9 ft., making allowance, in papering, for 2 windows, each 3x6 ft., and 3 doors, each 3x7 ft., the paper being 1 ft. 6 in. wide and 7 yd. in a roll? (2 credits for computing plastering surface correctly; 2 for papering; and 1 for cost.)

838. How many pounds of tea, at 72 cents a pound, would pay for 3 hogsheads of sugar, each weighing 1464 pounds, at 15 cents a pound?

839. A teamster agrees to cart 132 bbl. of flour for a merchant on Monday, 84 on Wednesday, and 108 on Friday; what is the largest number he can carry at a load, and yet have the same number in each?

840. In $\frac{3}{7}$ how many ninety-eighths?

841. How many yards in three remnants of cloth containing respectively $2\frac{1}{4}$ yd., $1\frac{1}{2}$ yd., and $2\frac{2}{3}$ yd.?

842. The sum of two numbers is $59\frac{8}{9}$, and the greater is $30\frac{5}{6}$: what is the other number?

843. Find the value of $(2\frac{2}{3} + 3\frac{4}{7}) \times (8\frac{4}{5} - 4\frac{1}{2})$.

844. How many cords in a pile of wood 196 ft. long, 7 ft. 6 in. high, and 8 ft. wide?

845-46. What will be the cost of removing the earth from the cellar of a house 48 ft. 9 in. long, 32 feet wide, and 9 feet deep, at \$0.57 per cubic yd? (2 credits: 1 for contents in cu. ft.; 1 for cu. yds. and price.)

847. A. has 25 per cent of his property invested in a house, 10 per cent in a farm, 5 per cent in a barn, and the rest in a grove worth \$4,800. What is the amount of his property?

848. Bought a barrel of syrup for \$20; what must I charge a gallon in order to gain 20 per cent on the whole?

849. B. sends \$6,897.12 to his agent in New Orleans, requesting him to invest in cotton after deducting his commission at 2 per cent: what was the sum invested?

850. It costs me \$72 annually to keep my house insured for \$18,000; what is the rate?

851. The difference in the time of St. Petersburg and Washington is 7 hr. 9 min. $19\frac{1}{4}$ sec. What is the difference in the longitude of the two places?

852. What is Insurance?

853. What is the Policy?

854. What is the Premium?

855. A man bought a farm, giving a note for \$3,400, payable in gold in five years; at the expiration of the time gold was 175 per cent: what did his farm cost in currency?

856. Find the simple interest of \$460.90 for 3 yr. 5 mo. 13 da. at $3\frac{5}{8}$ per cent.

857. C. bought a house for \$3,486, which rents for \$418.32. What rate per cent does he make on the investment?

858. Find the compound interest of \$380.80 for one year at 8 per cent interest payable *quarterly*.

859. What is True Discount?

860. What is Bank Discount?

861. What is the difference between the *bank* and the *true* discount on \$1,000 at 7 per cent, payable in 90 days?

862. What are the terms of Ratio severally called?

863. How is the ratio of two given numbers found?

864. Reduce the ratio 65 : 85 to its simplest terms.

865. Of how many ratios, at least, must a proportion consist?

866. The average cost of keeping 25 soldiers one year is \$3,000; what would it cost to keep 139 soldiers 7 years? (Solve by proportion.)

867. Find the square root of 466,489.

868-69. A pile of cord wood is 256 ft. long, 8 ft. high, and 16 ft. wide; what would be the length of each side of a cubical pile containing the same quantity?

— 36 —

870. The Atlantic cable cost as follows: 2500 miles @ \$485 per mi.; 10 miles deep sea cable @ \$1,450 per mi.; 25 miles shore ends @ \$1,250 per mi. What was the cost?

871. What is the number which divided by 453 gives the quotient 307, and the remainder 109?

872. Which are the so called "Fundamental Rules" of arithmetic? and (873), why are they so called?

874. What is a *prime factor*?

875. Find the prime factors of 2366.

876. A man working for \$2 a day, and paying \$4 a week for board, saved \$72 in ten weeks. How many week-days was he idle?

877. What is a *fractional unit*?

878. Reduce $\frac{4}{5}$, $\frac{5}{7}$, $\frac{3}{5} \frac{2}{3}$ and $4\frac{1}{3}$ to the least common denominator.

879. From $28\frac{1}{3}$ subtract $3\frac{9}{14}$.

880. Divide $\frac{5}{12} \times \frac{18}{25}$ by $\frac{1}{2} \times \frac{7}{8} \times \frac{5}{17} \times \frac{3}{5} \frac{4}{5} \times \frac{5}{7} \frac{1}{2}$

881. Divide 46.1975 by 54.35.

882. From a hogshead of molasses, 28 gal. 2 qt. were drawn: what *common fraction* represents the part of a hhd. which remained?

883. What *decimal part* of a fathom is $3\frac{3}{4}$ ft.?

884. If the consequent be $3\frac{1}{4}$ and the ratio 7, what is the antecedent?

885. When are *three* numbers said to be proportional?

886. If a water pipe discharge 24 bbl. in 1 hr. 14 m., in what time will it discharge 54 bbl.? (Solve by analysis.)

887. What is the cube root of 19.54, carried to 4 decimal places?

888. If it cost \$95.60 to carpet a room 24×18 ft., how much will the same kind of a carpet cost for a room 38×22 ft.? (Solve by proportion.)

889. What sum of money is that of which, if 80 per cent be deposited in bank, and 20 per cent of this deposit be drawn, there will remain \$5,760 in bank?

890. A lawyer collecting a note at a commission of 8 per cent thereon, received \$6.80. What was the face of the note?

891. Bought stock at par, and sold it at 3 per cent premium, thereby gaining \$750: how many shares, of \$100 each, did I buy?

892. What is the *amount* of \$16,941.20, for 1 yr. 7 mo. 28 da. at $4\frac{3}{4}$ per cent simple interest?

893. An investment of \$7,226.28 yields \$744.7937 annually: what is the rate of interest?

894. In what time will \$273.51 amount to \$312.864, at 7 per cent simple interest?

895. What is the difference between the *interest* and the *discount* of \$576, due 1 yr. 4 mo. hence, at 6 per cent?

896. Three men gain \$2,640, of which B. is to have \$6 as often as C. \$4 and A. \$2: what was each one's share?

897. Find the square root of 10795.21.

898. What is the length of one side of a square piece of land containing 40 acres?

899. How is the true discount of a note found?
 900. How is the bank discount of a note found?
 901. How is the present worth of a note payable at a future time without interest found?

— 37 —

902. Write in figures: two hundred thousand two hundred.
 903. A man owns farms valued at \$56,800; city lots valued at \$86,760; a house worth \$12,500; and other property, \$6,785: what is the entire value of his property?
 904. Bought 325 loads of wheat, each load containing 50 bu., at \$2 a bu. What did the wheat cost?
 905. Find the greatest common divisor of 679 and 1,869.
 906. Find the least common multiple of 4, 16, 20, 48, 60, and 72.
 907. What is the *value* of a fraction?
 908. Find the value of $1\frac{1}{2}\frac{2}{5}0$.
 909. If the divisor is less than a unit, how will the quotient compare with the dividend?
 910. Divide 63 by $\frac{7}{13}$.
 911. Find the difference between the continued products of $3, \frac{4}{5}, \frac{2}{3}, 4\frac{2}{5}$, and $3\frac{1}{8}, \frac{2}{5}, 4, \frac{2}{5}$.
 912. If 36.48 yd. of cloth cost \$54.72, what will 14.25 yd. cost?
 913. A goldsmith manufactured 1 lb. 1 pwt. 16 gr. of gold into rings, each weighing 4 pwt. 20. gr. He sold them for \$1.25 apiece: how much did he receive for them?

914. How many times will a wheel 16 ft. 6 in. in circumference turn round in running 42 miles?

915. What is the value of $\frac{5}{8}$ of a hogshead, in integers of lower denominations?

916. Washington is $77^{\circ} 2' 48''$ west, and St. Petersburg $30^{\circ} 19'$ east longitude: what is their difference of time?

917. What is $9\frac{1}{2}$ per cent of 275 miles?

918. A man sends \$3,246.20 to his agent in Boston, asking him to lay it out in shoes, after deducting his commission of 2 per cent. How much is his commission?

919. A gentleman has a house insured for \$8,000, and the furniture for \$4,000, at $2\frac{2}{3}$ per cent: what premium must he pay?

920. State the difference between percentage and interest.

921. What is the interest of \$1,500.60 for 2 yr. 4 mo. at $6\frac{1}{4}$ per cent?

922. Find the *amount* of \$387.20, from Jan. 1 to Oct. 20, 1878, at 7 per cent.

923. A man was offered \$3,675 in cash for his house, or \$4,235 in three years without interest: he accepted the latter offer: did he gain or lose, and how much, money being worth 7 per cent?

924. What are the proceeds of a note for \$368, at 90 days, discounted at *bank* at 6 per cent?

925. If 16 horses consume 128 bushels of oats in 50 days, how many bushels will 5 horses consume in 90 days? (Solve by Compound Proportion.)

926. Will the cube of $1\frac{3}{4}$ be greater, or less, than that fraction, and why?

927. What is the square root of .00008836?

928. The pedestal of a certain monument is a cube, containing 373,248 solid inches: what is the length of one of its sides?

929. A. loaned \$1,600 at 6 per cent, until it amounted to \$2,000: what was the time?

— 38 —

930-31. Write and define any four (or more) of the following terms: Notation; Roman Notation; Arabic Notation; Decimal Scale or System; Duodecimals; Numerator; Quotient. (1 credit for 2, and 2 for 4 or more correct answers.)

932. Write 1879 according to the Roman Notation.

933. Add the numbers: 1, 12, 123, 1234, 12345, 123456, 1234567, 12345678, 123456789.

• 934. Bought wheat at 94 cts. per bushel, to the amount of \$59.22, and sold for \$70.56: what was the selling price per bushel?

935. When are two numbers prime to each other? Give two such numbers, each greater than fifty.

936-37. Express the following numbers and processes, by the proper arithmetical signs, and find the result: The fraction whose numerator is 19 and denominator 760, being increased by $\frac{3}{80}$, and this sum multiplied by the square of 2, becomes a fraction whose square is $\frac{1}{16}$. (One credit for the expression and one for the solution.)

938-40. Reduce $(\$37\frac{1}{2} - \$13\frac{1}{4}) \times (\frac{2}{5} \text{ of } 8) \div 2\frac{3}{4}$. (One credit for each of the operations indicated by the signs $-$, \times , \div .)

941. If 5 be added to both terms of the fraction $\frac{3}{7}$, will its value be increased or decreased, and how much?

942. Express the value of $\frac{501}{1000000}$, without writing the denominator.

943. On a railroad 57 mi. 133 rd. $11\frac{1}{2}$ ft. long, there are 9 stations, including those at the two ends of the road. What is the average distance between the stations?

944. If 6 men can build 73 ft. of wall 4 ft. high in 5 days, how many feet can they build in 33 days?

(Solve by proportion.)

945. A merchant sold 86.55 tons of coal at \$5.24 per ton; how much did he receive (\$, cts., mills)?

946. In selling 86.55 tons of coal at \$5.24 per ton, a merchant made \$100.63; how much did the coal cost him, per ton?

947. A merchant sold 86.55 tons of coal at \$5.24 a ton, gaining \$100.63; what was his percentage of profit?

948. Find the difference of longitude between Constantinople, $28^{\circ} 59'$ E., and Boston, $71^{\circ} 3' 30''$ W.

949. When it is 12 M. at Constantinople, $28^{\circ} 59'$ E., what time A. M. or P. M. is it at Boston, $71^{\circ} 3' 30''$ W?

950. On what month and day will the following be due?

ALBANY, FEB. 13, 1879.

Sixty days after date, for value received, I promise to pay John Adams, or order, three hundred and seven $\frac{65}{100}$, dollars, at the Albany City National Bank.

\$307 $\frac{65}{100}$.

THOMAS JEFFERSON.

951. What would be the rate per cent of interest or discount on a note given and payable in this State, no rate being expressed?

952. What would be the proceeds of a note at 60 days for \$307 $\frac{65}{100}$, discounted at bank on the same day that it was made?

953. Find the present worth of \$890, due in 1 yr, 6 mo., without interest, allowing 8 per cent discount?

954. How would $7 \times 7 \times 7$ be written, according to the notation used in Involution?

955. Perform the operations indicated as follows:

$$\sqrt{558009} \div \sqrt[3]{\frac{27}{1728}} = ?$$

956. A certain room is 27 ft. long, 18 ft. wide, and 10 ft. high. How many pieces of paper $\frac{1}{2}$ yd. wide (9 yds. in a piece) will the side walls require, no allowance being made for doors, windows, etc.?

957. How many yards of carpeting, $\frac{3}{4}$ yd. wide, would be needed for a room 18×27 ft.?

— 39 —

958. In multiplication, which factor must be an abstract number, or used as such?

959. How many times is $\frac{3}{400}$ contained in 6,000?

960. The subtrahend being $14\frac{8}{9}\frac{7}{9}$, the minuend $15\frac{2}{4}\frac{2}{5}$ find the remainder.

961. How many square feet in a piece of land, 13 rods square?

962. If I buy stocks at 10 per cent below par and sell at 10 per cent premium, what per cent do I gain on my first investment?

963. Find the interest on \$5,500 for 1 yr. 6 mo. 9 da. at 6 per cent.

964. When it is noon on the prime meridian, where will it be $9\frac{1}{2}$ o'clock A. M.?

965. What will 7,580 bricks cost, at \$3.50 per M?

966. What is the difference between common and decimal fractions?

967. Divide fifteen thousandths by five ten-millionths.

968. Find the greatest common divisor of 153 and 187.
969. Find the least common multiple (or dividend) of the same numbers.
970. A cellar is to be dug 30 ft. long and 20 ft. wide: at what average depth will 50 cubic yards of earth have been removed?
971. A. B. and C. trade together. A. puts in \$1,000 for 10 months, B. \$800 for 12 months, C. \$900 for 14 months. They gain \$1,200. What is the share of each?
972. What is the square root of a number?
973. Find the sum of the composite numbers below 47.
974. Name the 4th decimal *order*.
975. Change .03125 to a common fraction, in its *lowest terms*.
976. If $3\frac{1}{2}$ cords of wood cost \$11.37 $\frac{1}{2}$, what will $12\frac{1}{8}$ cords cost? (Solve by proportion.)
977. John Brown bought of James Ray, on May 20, 1879, $2\frac{1}{2}$ yards broadcloth, at \$3.50 a yard, 2 pairs gloves at \$1.87 $\frac{1}{2}$ a pair, 19 yards silk, at \$1.75 a yard, and 33 yards sheeting, at 9 cents a yard. Make a bill in proper form and receipt it, as clerk.
978. How many rods of fence will be required to inclose a square field containing 90 acres?
979. What will be the cost of 4 lb. 5 oz. 6 pwt. of gold dust, at 75 cts. per pwt.?
980. Give the rule for extraction of square root.
981. Give the table of linear (or long) measure.
982. A coal dealer bought 300 long tons of coal at \$3.75 a ton, and sold it at \$4.60 per short ton. What was the total profit?
983. What is the rate per cent of profit in selling 300

long tons of coal, bought at \$3.75 a ton, at \$4.60 a short ton?

984. What would be the proceeds of the following note discounted at bank on the day that it was made:

BUFFALO, MAY 20, 1879.

Thirty days after date, for value received, I promise to pay to the order of John Young, one hundred and five $\frac{5}{100}$ dollars, at the Marine Bank.

\$105 $\frac{5}{100}$.

ICHABOD CRANE.

985. On what month and day must a note for 30 days, dated May 20, 1879, be paid, or in default of payment, be protested?

— 40 —

986. What number divided by 453 gives 307 as a quotient, and 109 as a remainder?

987. How does a divisor of a number differ from a multiple of that number?

988. Find the greatest common divisor of 56, 140, 182, and 98.

989. What are the prime factors of 11970?

990. Explain the principle (not process) of cancellation, and illustrate by an example.

991. What change do we make in the value of a fraction if we take the same number of parts but diminish their size?

992. $\frac{3060}{5940} = \frac{17}{33}$. Why?

993. Prove that $.625 = \frac{5}{8}$.

994. A vat 13 ft. square contains 1224 cu. ft. How deep is it?

995. Change .0000625 mi. to decimal of a foot.

996. $(24 \times \frac{8}{9} \text{ of } 7) \times (\frac{5}{6} \text{ of } 3 \times \frac{4}{15})$ = what?

997. The volume of a cube contains 91125 cu. ft. What is the length of each edge of the cube?

998. How many sq. ft. in the entire surface of a cube, each edge of which is 75 ft.?

999. I have an acre of land in shape of a rectangle, one side of which is 9 rods in length. What is the length of the other side?

1000. $\frac{4\frac{2}{3} \times 5\frac{1}{7} \times 8}{28\frac{1}{2} \div 7\frac{1}{3}} = \text{what?}$

1001. The time at a certain place is 16 hr. 10 m. earlier than at Greenwich. Give the longitude of the place.

1002. I have a rectangular field which measures 25 rods by 10 rods. At \$0.40 per yard, what will be the cost of boundary fences for the entire field?

1003. What will be the total cost, at the same rate as in Q. 1002, of cross fences to divide the same field into lots 5 rods square? Make a small diagram of the field and its subdivisions.

1004. In a school of 300 pupils, the boys are to the girls in the ratio of 13 to 17: required the number of each?

1005. If I sell goods at one-half their cost, what per cent do I lose, and if at double their cost, what per cent do I gain?

1006. If 18 men can dig a trench 30 yd. long in 5 da. of 8 h. each, in how many days of 10 h. each can 10 men do the same work?

1007. Show that $\frac{11}{2880}$ lb. Troy = $\frac{11}{12}$ pwt.

1008. From $\frac{5}{8}$ of a day take $\frac{7}{8}$ of an hour leaving result in hours, minutes and seconds.

1009. What will be the amount in three years of \$625, compounded at 7% annually?

1010. In what time will \$240 amount to \$720, at 12% simple interest?

1011. Find the proceeds of a note for \$1255.38 payable in 4 mo. 12 da., discounted at bank, interest being at 6%.

1012. What is the present worth of a note for \$1315.39, due in 2 years and 6 months, at 7%?

1013. Sold a horse for \$91, which was $\frac{7}{9}$ of what he cost me. How much did I lose?

— 41 —

1014. The quotient of one number divided by another is 37, the divisor 245, and the remainder 230: what is the dividend?

1015. Two men start from different places, distant 189 miles, and travel toward each other; one goes 4 miles, and the other 5 miles an hour: in how many hours will they meet?

1016. A merchant sold 18 barrels of pork, each weighing 200 pounds, at 12 cts. 5 mills a pound: what did he receive?

1017. Suppose a certain township is 6 miles long and $4\frac{1}{2}$ miles wide, how many lots of land of 90 acres each does it contain?

1018. What are the prime factors of 1800?

1019. Find the greatest common divisor of 1426, 322, and 598.

1020. What is the least common multiple of 9, 17, 6, and 27?

1021. Add $21\frac{1}{4}$, $32\frac{3}{8}$, and $47\frac{5}{14}$.

1022. { Reduce $\frac{18 \div \frac{1}{5}}{9 \times \frac{1}{4}}$ to its simplest form.

1023. How many times is .12 of 12 contained in .24 of 72?
1024. How many pounds of coffee, at $33\frac{1}{2}$ cents per pound, can be bought for \$14.50?
1025. What is the cost of 2684 bricks at \$8.50 per M.?
1026. Required the number of pounds in a hogshead of sugar, weighing 18 cwt. 3 qr. 14 lb.
1027. Reduce $\frac{5}{19}$ of a ton to integers of lower denominations.
1028. Sold a quantity of merchandise that cost \$1670, at a loss of 3%: for what amount did I sell it?
1029. A house was sold, at an advance of 5% on the cost, for \$13,000: what was the cost?
1030. What is the interest of \$475, for three years, at 5% simple interest?
1031. Required the amount of \$1350, from January 12, 1880, to September 19, 1881, at 9% simple interest.
1032. What sum of money at 5% simple interest, will yield \$275.40 in 3 years and 4 months?
1033. In what time will \$3750 amount to \$4541.25 at 6% per annum?
1034. What is the present worth of a debt of \$1650, due 8 months hence, without interest, money being worth 6%?
1035. What is the difference between true and bank discount on \$1000, for 63 days, at 6%?
1036. Sold flour at \$10.45 per barrel, and thereby lost 5% of the cost: what was the cost per barrel?
1037. Suppose a railroad train to run at the rate of 20 miles in 50 minutes, in what time will it run 275 miles?
1038. What will be the wages of 9 men for 11 days, if the wages of 6 men for 14 days be \$84?

1039. Find the square root of 149.4, correct to three decimal places.

1040. What is cube root?

1041. Required the cube root of 1860867.

— 42 —

1042. What are the fundamental rules of Arithmetic?

1043. Why are they so called?

1044. If a scholar's expenses are 90 dollars for board, 30 dollars for clothes, 12 dollars for tuition, 5 dollars for books, and 7 dollars for incidentals, what would be the expenses of 27 boys at the same rate?

1045. If 256 be multiplied by 25, the product diminished by 625, and the remainder divided by 35, what will be the quotient?

1046. What are the terms of a fraction?

1047. Subtract $120\frac{9}{17}$ from $450\frac{1}{2}$.

1048. $14\frac{2}{7}$, less $\frac{\frac{1}{2} \text{ of } 8\frac{2}{3}}{14\frac{7}{10}}$, is $\frac{2}{3}$ of $\frac{7}{3}$ of what number?

1049. Reduce .9375 to a common fraction.

1050. How many times will .5 of \$1.75 be contained in .25 of $17\frac{1}{2}$?

1051. How much must be paid for lathing and plastering overhead a room 36 feet long and 20 feet wide, at 26 cents a square yard?

1052. Reduce 150 sheets of paper to the decimal of a ream.

1053. A farmer having 760 sheep, kept 25 per cent of them, and sold the remainder. How many did he sell?

1054. What is Commission?

1055. What is Brokerage?

1056. An auctioneer sold a house for \$3284, and the furniture for \$2176.50; what did his fees amount to, at $2\frac{1}{4}$ per cent?

1057. A man purchased \$6275 stock in Pennsylvania Coal Company, and sold the same at a discount of 12 per cent: what was his loss?

1058. If $12\frac{1}{2}$ hundred weight of sugar cost \$140, how must it be sold to gain 25%?

1059. What will it cost to insure a factory valued at \$21,000, at $\frac{1}{4}$ per cent; and the machinery valued at \$15,400, at $\frac{5}{8}$ per cent?

1060. What is the interest on \$76.50 for 2 years, 2 months, at 5 per cent?

1061. Required the amount of \$387.20, from Jan. 1 to Oct. 20, 1879, at 6%?

1062. What will \$450 amount to in 1 year, at 6% compound interest, payable quarterly?

1063. What is the present worth of \$180, payable in 3 years, 4 months, discounting at 6 per cent?

1064. Wishing to borrow \$500 at bank, for what sum must my note be drawn, at 30 days, to obtain the required amount, discount being at 6%?

1065. At what per cent must \$1,000 be loaned for 3 years, 3 months, 20 days, to gain \$183.18?

1066. How long must \$204 be on interest at 6% to amount to \$217.09?

1067. If a staff 3 ft. 8 in. long cast a shadow 1 ft. 6 in., what is the height of a steeple that casts a shadow 75 ft. at the same time? (Solve by proportion.)

1068. Extract the square root of $\frac{7056}{9216}$.

1069. The pedestal of a certain monument is a cube

of granite, containing 373248 solid inches: what is the length of one of its sides?

— 43 —

1070. Express in words: 5000000750001.

1071. If the product of two numbers is 346712, and one of the factors is 76, what is the other factor?

1072. What is cancellation?

1073. Find the least common multiple of 4, 14, 28, and 98.

1074. The product of 3 numbers is $\frac{6}{7}$: two of the numbers are $2\frac{1}{2}$ and $\frac{3}{5}$: what is the third?

1075. What is the sum of six-millionths, four ten-thousandths, 19 hundred-thousandths, sixteen hundredths, and four tenths?

1076. Reduce $\frac{\frac{5}{8} \text{ of } 16.125}{4\frac{1}{3}}$ to a decimal fraction.

1077. Make a receipted bill of the following articles as if sold to John Smith by yourself:

16 lbs. of tea, at \$.85 per lb.

28 " " coffee, at $\$25\frac{1}{2}$ per lb.

15 yards of linen, at \$.66 per yard.

1078. How many acres are there in 250 city lots, each of which is 25 feet by 100?

1079. Add 96 bu. 3 pk. 2 qt. 1 pt., 46 bu. 3 pk. 1 qt. 1 pt., 2 pk. 1 qt. 1 pt., and 23 bu. 3 pk. 4 qt. 1 pt.

1080. By the chronometer, it is 4 hr. 56 min. $4\frac{2}{15}$ sec., P. M., at Greenwich, when it is 12 M. at New York; what is the longitude of New York?

1081. $\frac{1}{2}$ of $\frac{3}{7}$ is what part of $\frac{9}{11}$?

1082. How many pounds of thread will it require to

make 60 yd. of 3 qr. wide, if 7 lb. make 14 yd. of 6 qr. wide? (Solve by double rule of three).

1083. What is the difference between $5\frac{1}{2}$ per cent of \$800, and $6\frac{1}{2}$ per cent of \$1050?

1084. If I sell a piano which cost \$275, for \$315, what is the rate per cent of gain?

1085. What amount of government stock can I buy for \$15525, when it sells at $3\frac{1}{2}$ per cent premium?

1086. What is the simple interest of \$3750.87, for 2 years and 9 months, at 8 per cent?

1087. The interest of \$3675, for 3 years, is \$771.75: what is the rate?

1088. What is the *amount*, at compound interest, of \$250, for two years, at 8 per cent?

1089. What is the bank discount of a note of \$1000, payable in 60 days, at 6 per cent interest?

1090. A man who has only \$50, owes \$75 to A, \$150 to B, and \$100 to C: what should he pay to each?

1091. Find the 4th power of 16.

1092. What is the square root of 26883881?

1093. How many small cubes, at 2 inches on a side, can be sawed out of a cube 2 feet on a side, if nothing is lost in sawing?

1094. How many bricks, 8 inches long and 4 inches wide, will pave a yard that is 100 feet by 50 feet?

1095. There was a company of soldiers, of whom $\frac{1}{2}$ were on guard, $\frac{1}{6}$ preparing dinner, and the remainder, 55 men, were drilling: how many were there in all?

1096. A wall of 700 yards in length, was to be built in 29 days; 12 men were employed on it for 11 days, and only completed 220 yards: how many men must be added, to complete the wall in the required time?

1097. If a house is 50 feet wide; and the post which supports the ridge-pole is 12 feet high, what will be the length of the rafters?

— 44 —

1098. Copy and add:

\$ 5.67	23.21	6.78	92.14	1.23	3.78	61.37	9.00	1.07	7.16	6.78	1.78	223.06	5.61	4.45	4.56	7.89	3.07	4.56	3.45
---------	-------	------	-------	------	------	-------	------	------	------	------	------	--------	------	------	------	------	------	------	------

1099. From—

100200300400500600 take 908070605040302.

1100. Divide 4500700424 by 407.

1101. What is the value of 17 chests of tea, each containing 59 lbs., at \$0.67 per lb?

1102. For what is Troy weight used?

1103. Give the table of Troy weight.

1104. In 56 m. 7 fur. 37 rd. 12 ft. 9 in. now many inches?

1105. How many cords in a pile of wood 15 ft. long, 4 ft. wide, and $6\frac{1}{2}$ ft. high?

1106. John Quincy Adams was born July 11, 1767, and died February 23, 1848. To what age did he live?

1107. At £280 5s. $9\frac{1}{2}$ d. for 97 tons of lead, what is the cost per ton?

1108. Find, by cancellation, the quotient of—

$$8 \times 5 \times 3 \times 16 \times 28 \text{ divided by } 10 \times 4 \times 12 \times 4 \times 7.$$

1109. Find the last common multiple or dividend of 9, 8, 12, 18, 24, 36 and 72.

1110. Reduce $\frac{3}{4}$, $\frac{4}{5}$, $\frac{5}{6}$, $\frac{7}{8}$ to the least common denominator.

1111. How many cubic feet in 10 boxes, each $7\frac{3}{4}$ feet long, $1\frac{3}{4}$ ft. wide and $1\frac{1}{2}$ ft. high?

1112. If $\frac{9}{16}$ of a saw-mill are worth \$631.89, what are $\frac{5}{14}$ of it worth?

1113. Multiply eighty-seven thousandths by fifteen millionths.

1114. What is the value of .965625 of a mile, in integers of lower denominations?

1115. What is $\frac{7}{8}$ per cent of \$1,728?

1116. I have John Smith's note for \$144, dated July 25, 1879, payable on demand; how much will be due me, at 6 per cent simple interest, March 9, 1882?

1117. What is the amount of \$100 for 3 months, the interest to be added each month at 6 %?

1118. What is the present worth of \$477.71, due 4 years hence, discounted at 6 per cent?

1119. For what sum must a note at bank be made, payable in 3 months, at 6 per cent discount, to obtain \$300 at the present time?

1120. If I sell wood at \$7.20 per cord, and gain 20 per cent, what did it cost me per cord?

1121. If 5 men can harvest a field in 12 hours, how many hours would it require if 4 more men were employed? Solve by Rule of Three (Proportion.)

1122. If 15 oxen and 20 horses eat 6 tons of hay in 8 weeks, how much will 12 oxen and 28 horses require in 21 weeks? Solve by Double Rule of Three (Compound Proportion.)

1123. Find the square root of 9754.4376.

1124. What must be the depth of a cubical cistern that will hold 3048.625 cubic feet of water?

1125. How many tiles 8 in. square will cover a floor 18 ft. long and 12 ft. wide?

— 45 —

1126. Copy and add: 20570; 6206; 98.007; 63000; 426.000626; 4287; 63.961; 102030; 405.0607; 8090; 543.21; 1028848.414995.

1127. Express by Arabic Notation: MDXCVDCCCLXIV.

1128. Express by Roman Notation: 84796.

1129. Numerate: 20567189.004321098.

1130. Divide 31984875832 by 96813.

1131. Find the value of

$$\overline{(28-7) \times 6} + \overline{(92+7) \div 9} - \overline{(86+10) \div 12}.$$

1132. Divide, using cancellation:

$$15 \times 80 \times 27 \times 28 \text{ by } 7 \times 20 \times 8.$$

1133. Change $\frac{2}{21}$, $\frac{12}{7}$, $\frac{26}{169}$, and $\frac{1}{4}$ to similar fractions having their least common denominator, and (1134) reduce their sum to decimal form.

1135. Find the greatest common divisor of 7955, 8769, 6401.

1136. How much must be paid for making 52 rd. 14 ft. 8 in. of fence, at \$.75 per foot?

1137. A traveller, on reaching a certain place, found that his watch, which kept correct time for the place he left, was 2 hr. 22 mi. slower than the local time. Had he travelled eastward or westward, and how far, in circular measure, had he come?

1138. What per cent (expressed in words), of 30000 bushels are 50 bushels?

1139. What number diminished by 36% of itself = 336?

1140. What is the value of a lot 70 rd. long and 20 rd. wide, at \$47.25 per acre?

1141. A cistern has 3 pipes: The first will fill it in 12 hours, the second in 16, and the third in 18 hours. If all run together, in what time will they fill it? (State this example as a proportion, if you can.)

1142-43. What is the difference between simple interest on \$328 for 2 yr. 7 mo. at 7%, and compound interest on same amount for same time, at 6%?

1144. Find the balance due March 4 on a note dated January 1, 1879, for \$580 at 5%, on which a payment of \$85 has been made every 6 months,—using the U. S. rule.

1145. How much should be discounted on a bill of \$3725.87, due in 8 mo. 10 da., if paid immediately, money being worth 5%?

1146. Bought bonds at 115 and sold at 110, losing \$300. How many bonds of \$1000 each did I buy?

1147. If A. puts in \$4000 capital for 8 months, B. \$6000 for 7 mo. and C. \$3500 for 1 year, and they gain \$2320, what is each partner's share of the gain?

1148. If 5 horses eat as much as 6 oxen, and 8 horses and 12 cattle eat 12 tons of hay in 40 days, how much hay will 7 horses and 15 oxen eat in 65 days?

1149. Find the value of $\sqrt[3]{0.000238328}$.

1150. A steamer goes due north at the rate of 15 miles an hour, and another due west 18 miles an hour: how far apart will they be in 6 hours?

1151. Find the cost, at 30 cts. per sq. yd., of plastering the bottom and sides of a cubical cistern that will hold 300 barrels.

1152. What is the area of a circle 5 ft. in diameter?

1153. What is the difference between 5 sq. ft. and 5 ft. square? Illustrate by a diagram.

— 46 —

1154. Write 1881 in characters of the Roman notation.

1155. Write in words 73069294780069.

1156. Copy and add:

$$\begin{array}{r}
 123 \\
 456 \\
 7890 \quad 23 \\
 465 \quad 2001 \quad 62 \\
 \hline
 8877 \quad 603
 \end{array}
 \begin{array}{r}
 9 \quad 9824 \\
 865 \quad 7053 \\
 9998 \quad 482 \\
 431 \quad 7987 \\
 \hline
 23
 \end{array}$$

1157. Define multiplication, multiplicand, multiplier, and product.

1158. $330445150 \div 3145$ = what number?

1159. How could you obtain the dividend, the divisor, quotient and remainder being given?

1160. Find the least common multiple of 15, 18, 24, 35.

1161. Add $8\frac{4}{5}$, $\frac{7}{3}$, $3\frac{3}{5}$ and $4\frac{2}{3}$.

1162. Bought 18 lb. of butter at $28\frac{1}{2}$ ct. per lb., giving in return $22\frac{1}{2}$ lb. of lard at 12 ct. per lb., and the rest in cash; how much was the cash?

1163. Write with figures: Ninety-three and six hundred and nine ten-millionths.

1164. On a railroad 149 mi. 234 rd. 4 yd. 2 ft. long, there are 18 stations, including one at each end of the road. What is the average distance between stations?

1165. How many boards 12 ft. long and 4 in. wide are required to floor a room which is 36 ft. by 27 ft.?

1166. Find the difference in circular measure between Calcutta, E. Lon. $88^\circ 19' 2''$., and Philadelphia, W. Lon. $75^\circ 8' 54''$.

1167. Find the difference in time to correspond with your answer to Q. 1166.

1168. Reduce 23444 sq. in. to a compound number.

1169. What is the cost of 73590 lb. of coal, at \$6.55 per ton (2000 lb.)?

1170. 3 lb. 13 oz. are what per cent of 9 lb.?

1171. Define *per cent* and *percentage*, as these terms are used in Arithmetic.

1172. Find the simple interest on \$740 for 1 yr. 5 mo. 21 da., at $4\frac{1}{2}$ per cent?

1173. What principal will amount to \$310.60 in 3 yr. 5 mo. 9 da., at 5 per cent simple interest?

1174. What must be the face of a note for 90 days, at 6 per cent, on which I can obtain at bank \$472.86?

1175. Two numbers are to each other as 7 to 11, and the greater is 329: what is the less?

1176. Paid \$2225 for 180 sheep and sold them for \$2675: what should I gain on 1200 sheep at the same rate? (Solve by Proportion.)

1177. If it cost \$176 to hire 12 horses for 5 days, what will it cost to hire 10 horses for 18 days? (Solve by Compound Proportion.)

1178. How many miles of fence would be required to enclose 640 acres laid out as an exact square?

1179. What is the cube root of 104329?

1180. A person after spending $\frac{1}{3}$ and $\frac{1}{4}$ of his money and \$20 more, had \$80 left. What had he at first?

1181. The width of a building being 38 ft., and the ridge of the roof 5 ft. higher than the eaves, how many feet of boards would be required to cover one of the gable ends?

— 47 —

1182. Write in figures and numerate: Nine units of the 8th order, six of the 7th, three of the 5th, seven of the 4th, nine of the 1st.

1183. Copy and numerate: 9004082501.

1184. $(256 \times 25) - 625 \div 35 = ?$

1185. Find the prime factors of 2310.

1186. What is the greatest common divisor of 1313 and 4108?

1187. What is the least common multiple of 84, 100, 224 and 600?

1188. If $235\frac{1}{2}$ acres of land cost $\$4725\frac{3}{8}$, what will 628 acres cost, at the same rate?

1189. From four hundred twenty-seven thousandths take four hundred twenty-seven millionths.

1190. Divide .125 by 8000.

1191. Add six hundred and twenty-five thousandths; four tenths; seven, and sixty-two ten-thousandths; three, and fifty-eight millionths; ninety-two, and seven hundredths.

1192. What is the cost of 18640 ft. of timber, at \$4.50 per 100 ft.?

1193. How many cubic inches does the standard (wine) gallon contain? 1194. The standard bushel?

1195. Reduce 41760 grains to pounds.

1196. In 10 mi. 7 ch. 4 rd. 20 l., how many links?

1197. Reduce 3 ot. 1 pt. 1 gi. to the decimal of a gallon.

1198. How many shingles will it take to cover the roof of a building 46 feet long, each of the two sides

of the roof being 20 ft. wide, allowing each shingle to be 4 in. wide, and 5 in. of the length to be exposed to the weather?

1199. What will it cost to build a wall 240 ft. long, 6 ft. high, and 3 ft. thick, at \$3.25 per 1000 bricks, the size of each brick being 8 in. x 4 in. x 2 in.?

1200. If a note for \$605.70 given June 20, 1878, on simple interest at 8 per cent, be taken up June 20, 1881, what amount will then be due, if no interest has been paid?

1201. A man invests \$2000 in bank stock, and receives a semi-annual dividend of \$75: what is the rate per cent of income, per annum?

1202. Give the U. S. rule for partial payments.

1203. What is the present worth of a note for \$1315.389, due in 2 y. 6 mo., at 7 per cent?

1204. If 6 men dig a cellar 22.5 ft. long, 17.3 ft. wide, and 10.25 ft. deep, in 2.5 days, of 12.3 ho., in how many days of 8.2 ho., can 9 men dig one 45 ft. long, 34.6 ft. wide, and 12.3 ft. deep?

1205. If an army of 55225 be massed in a solid square, how many men will there be on a side?

1206. A man bought a farm 198 rods long and 150 rods wide, and agreed to give \$32 an acre: how much did the farm cost him?

1207. What is the length of one edge of a cistern of cubical form, containing 1331 solid feet?

1208. How many barrels does such a cistern as the one described in the preceding question, contain?

1209. Name and describe the standard unit of weight in the Metric system.

— 48 —

1210. Name five fundamental rules or operations of arithmetic.
1211. What is a composite number?
1212. Find the prime factors of 320.
1213. What factors of two or more numbers must their greatest common divisor contain?
1214. Find the greatest common divisor of 527 and 1207.
1215. What is the least common multiple of 24, 48, 60 and 100?
1216. What does the numerator of a fraction show?
1217. What does the denominator show?
1218. From $20\frac{1}{4}$ take $13\frac{1}{4}$.
1219. If 5 barrels of flour cost $\$48\frac{3}{4}$, how many barrels can be bought for $\$263\frac{1}{4}$? (Solve by analysis.)
1220. Divide .00144 by 1.2.
1221. How do you prove an example in division?
1222. London is $77^{\circ} 1'$ east of Washington; what time is it at Washington when it is 12 M. at London?
1223. What will 4 cwt. 3 qr. 15 lb. of sugar cost at \$8.95 a cwt. (=100 lbs.)?
1224. A pile of wood is 6 ft. high, and 4 ft. wide: how long must it be to contain 10 cords?
1225. How many acres in a rectangular field that is 50 chains long and 30 chains wide?
1226. What is 150 per cent of \$560.25?
1227. 47 is 20% of what number?
1228. A wagon was sold for \$329, which was $16\frac{2}{3}\%$ more than it cost: what did it cost?

1229. If the interest of \$36 for 3 yr. 8 mo. 19 da. is \$8.034, what is the rate?
1230. What is the bank discount on \$120 for 120 days, at 7%? (Consider 360 days=1 year.)
1231. What is the true discount on \$120 for 120 days, at 7%? (Consider 360 days=1 year.)
1232. If $\frac{3}{8}$ of an acre of land is worth \$148, how much is $\frac{1}{16}$ of an acre worth? (Solve by proportion.).
1233. If 15 men in 9 days, by working 9 hours a day, build 36 rd. of stone-fence, how many rd. can 25 men build in 15 days, by working 8 hours a day? (Solve by compound proportion.)
1234. A. and B. entered into partnership: A. furnished \$240 for 8 mo., and B. \$559 for 5 mo. They lost \$118: how much did each man lose?
1235. In 25 kilogrammes how many pounds, Troy weight? (1 gramme=15.432 gr.)
1236. What is the square root of 222784?
1237. Give the method of proof for square root and prove answer to Q. 1236.

— 49 —

1238. What is arithmetic?
1239. What is a concrete or denominate number?
1240. By what must I divide .7847 to get 1.9?
1241. What kind of a number must a multiplier be?
1242. What mixed number, multiplied by $25\frac{1}{4}$, will produce $54\frac{5}{12}$?
1243. What is a decimal fraction?
1244. By how much does the cube of fifty-three hundredths exceed one millionth?

1245. Reduce $5\frac{2}{3}$, $9\frac{3}{4}$, $4\frac{5}{8}$ to improper fractions, and then to their least common denominator.
1246. Add the numbers in Q. 1245.
1247. Reduce your answer to Q. 1246 to a whole number and decimal (carrying the result to five decimal places).
1248. If it requires 1 bu. 2 pk. of rye to sow an acre, how many quarts would be required for a rectangular field 484 ft. long by 270 ft. wide?
1249. What is the druggist's profit if he buys 5 lb. of opium at \$12 per lb. avoirdupois, and sells it at \$1 per oz. Troy? (7000 gr. = 1 lb. avoirdupois.)
1250. What would it cost to dig a cellar 30 ft. x 35 ft. x 8 ft., at \$.84 per cubic yard?
1251. The longitude of New York being $74^{\circ} 0' 3''$ W. and that of San Francisco being $122^{\circ} 23'$ W., what time is it at San Francisco when it is 1 p. m. at New York?
1252. Reduce 12 miles to kilometers. (A meter = 39.37 in.).
1253. Into what pairs of factors may 12 be resolved?
1254. What is the cost of 2 T. 15 cwt. (100 lbs.) 2 qr. 15 lb. of hay, at \$12.50 per T.?
1255. Bought a hhd. of sugar for \$55.75, and sold it at a profit of $12\frac{1}{2}$ per cent: what was the total profit?
1256. What was the rate per cent of a tax for \$52.88 $\frac{1}{4}$ on property assessed at \$3,525.50?
1257. What is the discount, at 8 per cent, on a note for \$750, payable without interest, in 2 yr. 3 mo. 20 da.?
1258. Find the proceeds of a note for \$1,000, due in 90 days, discounted at bank at 6 per cent.
1259. C. owes D. \$900, of which \$200 will be due in

3 mo., \$300 in 6 mo., and the balance in 12 mo. What would be the mean or equated time of payment?

1260. In the firm of A. & B., A invested \$200 for 7 mo. and B. \$300 for 9 mo. They gained \$125: what was each one's share of the gain?

1261. How many feet long is each side of a square acre?

1262. If fifteen men can do a certain piece of work in 90 days of 10 hours each, in how many days of 12 hours each can 20 men do the same work?

1263. What is the premium on a building valued at \$3,000, insured for $\frac{2}{3}$ of its value, at $2\frac{1}{4}$ per cent?

1264. Find the lacking term in the proportion:

$$10 \text{ gal. } 3 \text{ qt.} : \text{---} :: 5 : 9.$$

1265. Find the length of the edge of a cubical box containing 262144 cu. ft.

— 50 —

1266. What do you understand by the prime factors of a composite number?

1267. Find the greatest common divisor of 360, 248, 972.

1268. Find the least common multiple of 14, 16, 21, 24, 112.

1269. Exchanged a carriage worth \$140, and five sets of harness worth \$29 each, for 45 cords of wood and \$73.50: what was the wood valued at, per cord?

1270. Express the present year of the Christian era, by Roman notation.

1271. Express in words: 645000021903.

1272. Copy and numerate: 14627.5623.

1273. State the essential difference between common and decimal fractions.

1274. Write the table of linear (or long) measure.

1275. A. owns $\frac{3}{11}$ of a farm worth \$15,422, and sells $\frac{2}{3}$ of his share. Find the value of what he has left.

1276. $\frac{3}{4}$ of $\frac{4\frac{5}{9}}{6\frac{1}{6}}$ $\div \frac{11\frac{1}{7}}{6\frac{9}{11}}$ = what?

1277. $(12 \times 5 \times 153 \times 35 \times 18 \times 2)$ divided by $(3 \times 14 \times 9 \times 5 \times 17 \times 20 \times 6)$ = what? (Use cancellation.)

1278. Divide 87 lb. 8 oz. 19 pwt. 21 gr. by 7, leaving the result in the same denominations.

1279. Reduce .21675 T. to integers or of lower denominations.

1280. How many flagstones averaging 2 ft. long by 1 ft. 3 in. wide will be required for a walk 250 ft. long and 4 ft. 6 in. wide?

1281. Find the side of a square field equivalent to a rectangular one 2859 yd. long and 714 yd. wide.

1282. If a pile of wood 36 ft. long, 4 ft. wide and 5 ft. high cost \$58.50, what will a pile 60 ft. long, 4 ft. wide and 6 ft. high cost at the same rate? (Solve by proportion.)

Suppose that Jonas Smith owes you \$343, for which he gives his promissory note of this date, payable to your order in 90 days, with legal interest, (1283) Write a complete copy of the note, and (1284) compute the amount payable when due, including three days grace.

1285. How much can I realize on a note for \$2144.50 due in 3 mo. 10 da., discounted at bank at 8 per cent?

1286. Bought 150 bbl. of flour at \$6.75 per bbl., and

sold it at $12\frac{1}{2}$ per cent advance: what amount did it bring?

1287. How long must \$240 be on interest at $8\frac{1}{2}$ per cent to amount to \$266.40?

1288. A vessel and cargo are valued at \$297000. The premium paid for insurance on $\frac{2}{3}$ of their value was \$2475. What was the rate of insurance?

1289. What sum of money will amount to \$228.60 in 2 yr. 4 mo. 18 da., at 6 per cent?

1290. How many gallons in $24\frac{1}{2}$ hektoliters of wine?
(A liter = 1.0567 qt.)

1291. Explain the difference between specific and ad-valorem duties.

1292. Extract the cube root of 50653.

Helps in Teaching Arithmetic.

1. *First Steps Among Figures.* A drill book in the Fundamental Rules of Arithmetic. By LEVI N. BEEBE. Cloth, 16mo, 3 editions. *Pupils' Edition*, pp. 140, 45 cts. *Oral Edition*, pp. 139, 50 cts. *Teachers' Edition*, including all in both the others, with additional parallel matter, Index, and Key, pp. 226, \$1.00.

2. *The Pestalozzian Series of Arithmetics.* Teacher's Manual and First-Year Text-Book for pupils in the first grade. Based upon Pestalozzi's method of teaching Elementary Number. By JAMES H. HOOSE. Boards, 16mo, 2 editions. *Pupils' Edition*, pp. 156, 35 cts. *Teacher's Edition*, containing the former, with additional matter, pp. 217, 50 cts.

3. *The Word Method in Number.* A series of 45 Cards, on which are printed all the possible Combinations of Two Figures. In box. By H. R. SANFORD. Size $3\frac{1}{4} \times 6$ inches. Price 50 cts.

4. *A Work in Number for Junior Classes* in Graded Schools. By MARTHA ROE. Cloth, 16mo, pp. 116. Price 50 cts.

5. *Intermediate Problems in Arithmetic for Junior Classes;* containing more than 2,000 problems in Fractions, Reduction, and Decimals. By EMMA A. WELCH. Cloth, 16mo, pp. 96. Price 50 cts.

6. *The Regents' Questions in Arithmetic,* being the 1293 questions given at the first 50 examinations held by the Regents of the University of the State of New York. Manilla, 16mo, pp. 93. 25 cts. Key, 25 cts. The same on Card-Board Slips, in Box, with Key, \$1.00.

7. *Dime Question Book, No. 18, Arithmetic.* By ALBERT P. SOUTHWICK Paper, 16mo, pp. 39. Price 10 cts.

8. *A Manual of Suggestions for Teaching Fractions,* especially designed to accompany a Fractional Apparatus for developing the Idea of Fractions. By W. W. DAVIS. Paper, 16mo, pp. 43. Price 25 cts. Price of the Apparatus, net, \$4.00.

9. *The 30 Possible Problems of Percentage,* embracing a full and exhaustive discussion of the Theory of General Percentage, with 100 illustrative examples. By W. H. BRADFORD. Manilla, 16mo, pp. 34. Price 25 cts.

10. *Latitude and Longitude, and Longitude and Time.* Embracing a comprehensive discussion, with over 100 illustrative questions and examples. By J. A. BASSETT. Manilla, 16mo, pp. 42. Price 25 cts.

11. *The International Date-Line, or Where does the Day Begin?* By HENRY COLLINS. Paper, 16mo, pp. 15. Price 15 cts.

12. *A Manual of Mensuration,* for use in Common Schools and Academies. By H. H. HUTTON. Boards, 16mo, pp. 150. Price 50 cts.

13. *Number Lessons,* somewhat after the Grubé Method, giving on one side the combinations of the digits, and on the other an unlimited series of drill-exercises. Heavy card-board, 10x11 inches. Price 10 cts.

14. *Age-Cards,* containing 9 columns of figures, to determine a person's age by adding the top numbers of those columns in which the number representing the person's age is found. Heavy card-board, 4x6. Price 10 cts.

15. *Cube Root Blocks,* carried to 3 places. Size 3 inches, in box. \$1.00.

16. *Numeral Frames,* with 100 Colored Balls, \$1.25; with 150 Colored Balls, \$1.50.

17. *Algebra for Beginners.* By O. S. MICHAEL. Cloth, 16mo, pp. 120. Price 75 cts.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

Helps in Regents' Examinations.

1. *Regents' Examination Paper.* Six styles.

For the Regents' examinations we now prepare five forms of Examination paper, all printed from new plates, and with some changes suggested by the board of Regents.

PRICES PER REAM.

NOTE.—All the paper weighs fourteen pounds per ream of 480 full sheets of legal cap, but is put up in reams of 480 half sheets, weighing seven pounds. Please specify the letter, in ordering. NO ORDERS FILLED EXCEPT FOR EVEN REAMS. Even schools which have but two or three scholars to try will find it profitable to keep a ream on hand. So much less attention as to the form of the paper is required of the scholar that he can give his undivided attention to answering the questions. It is now the practice of many of the best schools to put the scholars intending to try through one complete examination with questions given at a previous time, using this paper, and having all the formalities complied with. This gives the scholars confidence, and precludes the nervousness which is often fatal to success.

B. All printed, for Arithmetic, Geography, or Grammar.....	\$2.25.
C. All printed and numbered for Spelling.....	2.50.
D. 37 sheets Spelling, printed and numbered,	
185 sheets Arithmetic, Geography, Grammar, printed,	
258 sheets Arithmetic, Geography, Gram., not printed,	
480 sheets complete for 37 pupils, 2.00.

The last form is preferred by nine-tenths of the schools, and we recommend it as the cheapest and most satisfactory. The sheets printed on the back are used only for the last sheet in each exercise, usually the second in Arithmetic and Geography, and the third in Grammar.

E. The same as D. except that ALL the sheets in Arithmetic, Grammar, and Geography are printed upon the back.....	2.40.
F. All printed, for the Advanced Examinations only.....	2.25.
G. All unprinted, suitable for any school examinations.....	1.75.

 When five reams are ordered at one time, *the name of the institution ordering* will be printed on the back, if desired, without extra charge.

2. *Regents' Examination Cards.* A most convenient device for keeping a permanent record of the studies in which each pupil has passed. Manilla, $5\frac{1}{2} \times 7$ in., per hundred, 50 cts.

3. *Regents' Examination Record.* Half-leather, folio, 9x14 in., in two sizes: a. 72 leaves, for 720 scholars, \$2.00; b. 144 leaves, for 1440 scholars, \$2.50.

Instead of loose cards, the Record gives on each page the record of five scholars, and is thus fitted for permanent reference. It is substantially bound, with title-page and alphabetical index.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

Helps in Teaching Literature.

1. *A Series of Questions in English and American Literature*, prepared for class drill and private study by MARY F. HENDRICK, teacher in the State Normal School, Cortland, N. Y. 16mo, boards, pages 100, interleaved. 35 cts.

This edition is especially prepared for taking notes in the literature class, and may be used in connection with any text-book or under any instruction.

2. *Early English Literature*, from the Lay of Beowulf to Edmund Spenser. By W. B. HARLOW, instructor in the High School, Syracuse, N. Y. 16mo, cloth, pp. 138. 75 cts.

This handsome volume gives copious extracts from all leading authors, of sufficient length to afford a fair taste of their style, while its biographical and critical notes give it rare value.

3. *Dime Question Book No. 2, General Literature*, and *No. 13, American Literature*. By ALBERT P. SOUTHWICK. 16mo, paper, pp. 35, 39. 10 cts. each.

These are among the most interesting books in the series, abounding in allusion and suggestion, as well as giving full answers to every question. They afford a capital drill, and should be used in every class as a preparation for examination.

4. *How to Obtain the Greatest Value from a Book*. By the Rev. R. W. LOWRIE. 8vo, pp. 12. 25 cts.

No one can read this essay without pleasure and profit.

5. *The Art of Questioning*. By JOSHUA G. FITCH. 16mo, paper, pp. 36. 15 cts.

Mr. Fitch, one of Her Majesty's inspectors of schools, now recognized as the ablest of English writers on education, owed his early reputation to this address, the practical helpfulness of which is everywhere acknowledged.

6. *The Art of Securing Attention*. By JOSHUA G. FITCH. 16mo, paper, pp. 43. 15 cts.

The *Maryland School Journal* well says: "It is itself an exemplification of the problem discussed, for the first page fixes the attention so that the reader never wearies, till he comes to the last and then wishes that the end had not come so soon."

7. *The Elocutionist's Annual*, comprising new and popular Readings, Recitations, Declamations, Dialogues, Tableaux, etc., etc. Compiled by Mrs. J. W. SHOEMAKER. Paper, 16mo, pp. 200. 12 Numbers. Price of each, 30 cts.

Though primarily designed for classes in elocution, the character of the selections is so high that any of these volumes may be used with profit in a literature class.

8. *The Bible in the Public Schools*. Paper, 24mo, 2 vols., pp. 214, 223. 50 cts.

These volumes contain the most important arguments, decisions, and addresses connected with the celebrated contest in Cincinnati, 1860.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

Helps in Teaching Arithmetic.

1. *First Steps Among Figures.* A drill book in the Fundamental Rule of Arithmetic. By LEVI N. BEEBE. Cloth, 16mo, 3 editions. *Pupils' Edition*, pp. 140, 45 cts. *Oral Edition*, pp. 139, 50 cts. *Teachers' Edition*, including all in both the others, with additional parallel matter, Index, and Key, pp. 326, \$1.00.

2. *The Pestalozzian Series of Arithmetics.* Teacher's Manual and First-Year Text-Book for pupils in the first grade. Based upon Pestalozzi's method of teaching Elementary Number. By JAMES H. HOOSE. Boards, 16mo, 2 editions. *Pupils' Edition*, pp. 156, 35 cts. *Teacher's Edition*, containing the former, with additional matter, pp. 217, 50 cts.

3. *The Word Method in Number.* A series of 45 Cards, on which are printed all the possible Combinations of Two Figures. In box. By H. R. SANFORD. Size $3\frac{1}{4} \times 6$ inches. Price 50 cts.

4. *A Work in Number for Junior Classes* in Graded Schools. By MARTHA ROE. Cloth, 16mo, pp. 116. Price 50 cts.

5. *Intermediate Problems in Arithmetic for Junior Classes;* containing more than 2,000 problems in Fractions, Reduction, and Decimals. By EMMA A. WELCH. Cloth, 16mo, pp. 96. Price 50 cts.

6. *The Regents' Questions in Arithmetic,* being the 1293 questions given at the first 50 examinations held by the Regents of the University of the State of New York. Manilla, 16mo, pp. 93. 25 cts. Key, 25 cts. The same on Card-Board Slips, in Box, with Key, \$1.00.

7. *Dime Question Book, No. 18, Arithmetic.* By ALBERT P. SOUTHWICK. Paper, 16mo, pp. 39. Price 10 cts.

8. *A Manual of Suggestions for Teaching Fractions,* especially designed to accompany a Fractional Apparatus for developing the Idea of Fractions. By W. W. DAVIS. Paper, 16mo, pp. 43. Price 25 cts. Price of the Apparatus, net, \$4.00.

9. *The 30 Possible Problems of Percentage,* embracing a full and exhaustive discussion of the Theory of General Percentage, with 100 illustrative examples. By W. H. BRADFORD. Manilla, 16mo, pp. 34. Price 25 cts.

10. *Latitude and Longitude, and Longitude and Time.* Embracing a comprehensive discussion, with over 100 illustrative questions and examples. By J. A. BASSETT. Manilla, 16mo, pp. 42. Price 25 cts.

11. *The International Date-Line, or Where does the Day Begin?* By HENRY COLLINS. Paper, 16mo, pp. 15. Price 15 cts.

12. *A Manual of Mensuration,* for use in Common Schools and Academies. By H. H. HUTTON. Boards, 16mo, pp. 150. Price 50 cts.

13. *Number Lessons,* somewhat after the Grubé Method, giving on one side the combinations of the digits, and on the other an unlimited series of drill-exercises. Heavy card-board, 10x11 inches. Price 10 cts.

14. *Age-Cards,* containing 9 columns of figures, to determine a person's age by adding the top numbers of those columns in which the number representing the person's age is found. Heavy card-board, 4x6. Price 10 cts.

15. *Cube Root Blocks,* carried to 3 places. Size 3 inches, in box. \$1.00.

16. *Numeral Frames,* with 100 Colored Balls, \$1.25; with 150 Colored Balls, \$1.50.

17. *Algebra for Beginners.* By O. S. MICHAEL. Cloth, 16mo, pp. 720. Price 75 cts.

C. W. BARDEEN, Publisher, Syracuse, N. Y.

513UN3R

C001

THE REGENTS' QUESTIONS SYRACUSE, N. Y.

School Bulleti

The School Agency has been formed for the best teachers and the best place he is best fitted for, among dozens of teachers on our list who want special work, superintendence to a large city,—some surrounding circumstances that they do not have in their present location. We have scores who are giving entire satisfaction where they are, and are paid as much as the community can afford, but who feel that they are capable of doing good work in a wider field and at a higher salary. We have others who are tolerably satisfied where they are, and who expect to stay, but who have encountered some opposition on the board of education, and who want at least to have opportunity to decline some other position, that their own board may see they are not absolutely dependent on them for daily bread.

But most of our teachers come to us to take advantage of what our system can do toward introducing DISCRIMINATION in the hiring of teachers. For years we have urged that this was all good teachers needed. Make sure that only well-fitted teachers shall fill a certain place, and salary will take care of itself. Toward this our Agency has already done something, and will do more. The school-board that comes to us can have the teachers of the whole country to choose from, instead of having to select from those that happen to be near by. The teacher may specify the kind of work he wants to do, and if he is well-fitted and will be patient, he can get it.

Whether this Agency is trustworthy may be judged from the fact that during the first twenty-seven months of its working it filled the following fifty principalships in New York normal, high, and union schools, and academies, besides more than 200 subordinate positions.

Alexander, Amenia *Ac.*, Amsterdam *Ac.*, Andover, Angola, Auburn (\$2000), Baldwinsville, Belfast, Brasher Falls, Canandaigua *Ac.*, Canastota, Champlain, Chittenango, Crown Point, Dunkirk, Fairfield *Sem.*, Friendship *Ac.*, Geddes, Greenville *Ac.*, Heuvelton, Homer, Hudson, Ilion (\$1600), Ives *Sem.*, Jasper, Manlius, Mannsville, Mohawk, Moravia, Morrisville, Newark, Owego (\$1500), Painted Post, Phoenix (\$1500), Potsdam (\$2800), Poughkeepsie (\$1800), Rensselaerville *Ac.*, Richfield Springs, St. Johnsville, Salamanca, Sandy Creek, Saratoga Springs, Silver Creek, Ticonderoga, Warsaw, Washingtonville, West Troy, Westport, Whitney's Point, Yates *Ac.*

Among positions in other States may be mentioned :

For men, Jersey City, \$2600 and \$2500; East Orange, N. J., \$1000; Leavenworth, Ks., \$3000; Ouray, Colo., \$1000; New Orleans, La., \$1000; etc. For women, Marshalltown, Ia., \$1000; St. Joseph, Mo., \$850; Napa, Cal., \$800; Ishpenning, Mich., \$700; So. Norwalk, Ct., \$650. Among places for women in New York, we may mention Buffalo Normal, \$1200, Saratoga, \$1000, etc.

If you want a better position, is it not fair to assume that your best method is by application to this Agency. For particulars, send stamp to

C. W. BARDEEN, Syracuse, N. Y.



3 0112 017106599